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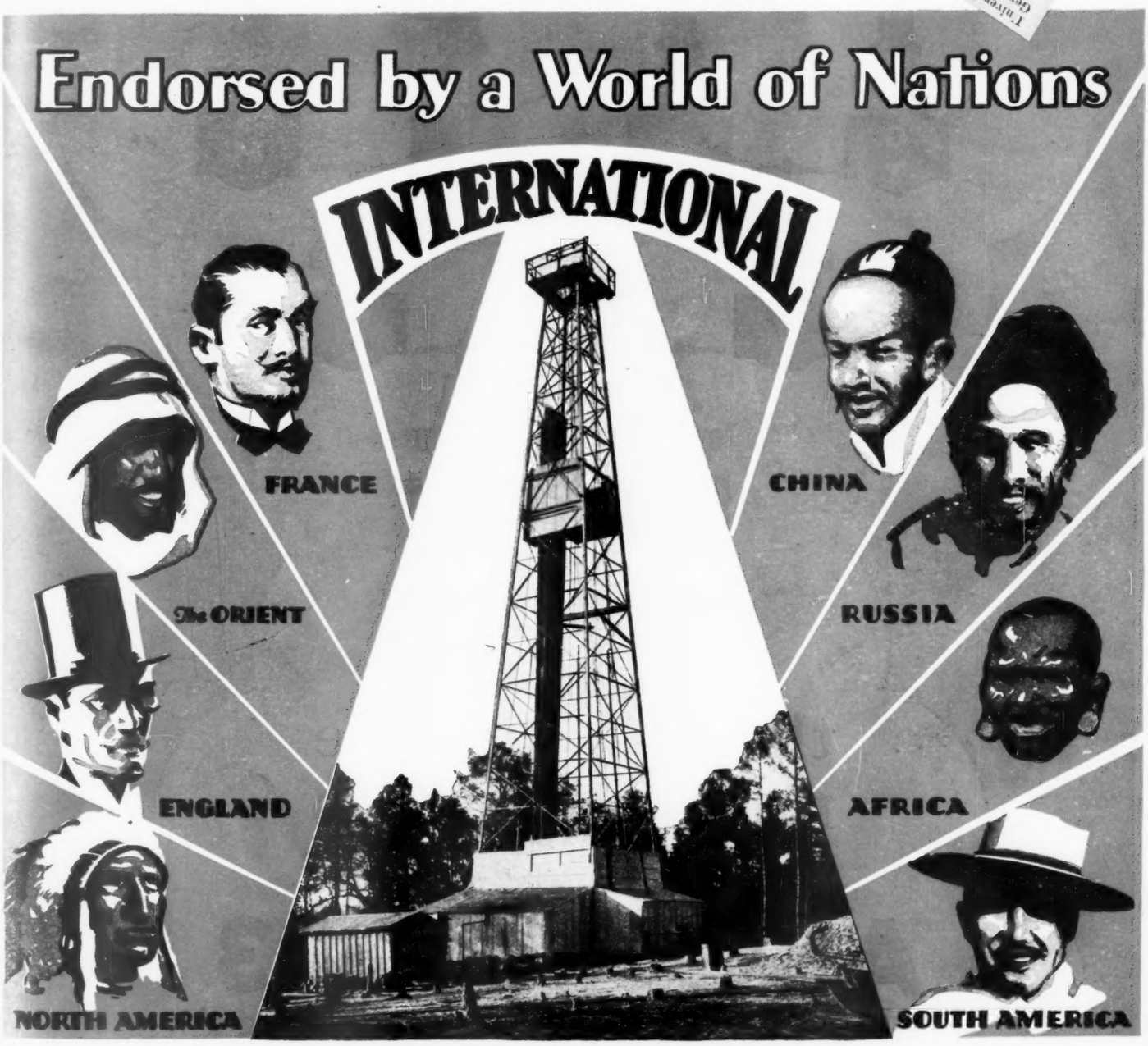

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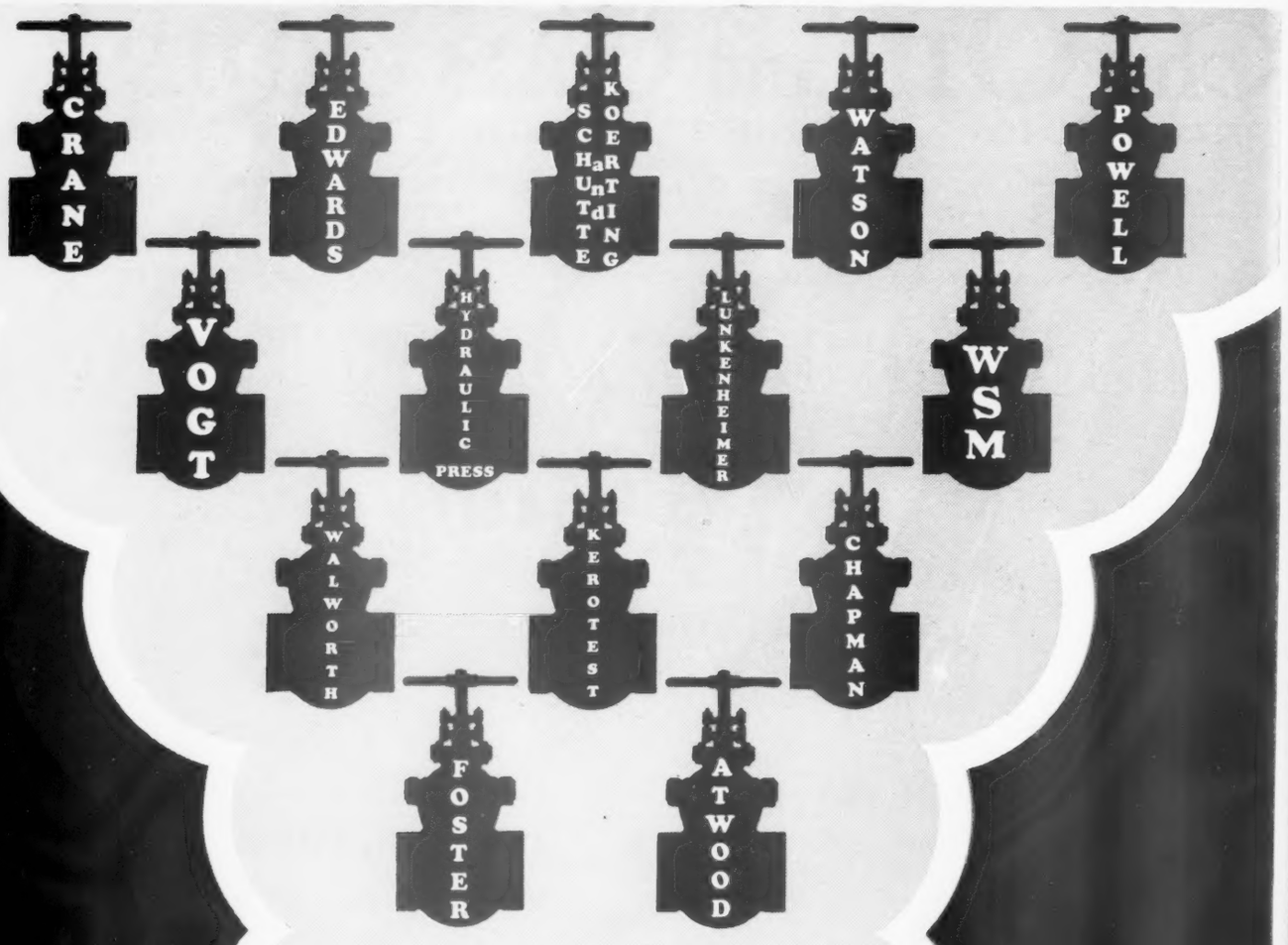
Advertisers' Index on Page 39

Table of Contents on Page 40



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Andrew
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Athey T
Axelson
Ayer &

Baash-R
Babcock
Badger,
Baker C
Baldwin
Barber
Barco M
Barnick
Barnsda
Bartlett
Beaumo
Bendste
Bessem
Bethleh
Bigelow
Bignall
Blackor
Black V
Borden
Braden
Braun,
Brewste
Bridgep
Bristol
Broderi
Brown,
Brown
Buda C
Buckeye
Buffalo
Burt M
Butler
Byers,
Byron

Camero
Carbon
Carey,
Caterpi
Central
Central
Cessna
Chain
Champi
Chaplin
Chapma
Chestnu
Chicago
Chicago
Chicago
Chishol
Clark
Classifi
Climax
Colona
Columb
Columb
Consoli
Contine
Cooke
Cooper,
Crane
Crane

D. & B
Darling
Dart, F
Davis,
Dearbo
Delta
Detroit
Dodge
Donova
Drane
Dresser
Dunn
Du Pon

The ADVERTISERS' INDEX

A

Acme Fishing Tool Co. .....
Ajax Iron Works .....
Ajax Rope Co. .....
Alco Oil Tool Co. 160
Alfit Mfg. Co., Inc. .....
Allegheny Steel Co.....Inside Front Cover
Allis-Chalmers Mfg. Co. .....
Aluminum Co. of America 21
American Askania Corp. 168
American Asphalt Paint Co. .....
American Cable Co., Inc. .....
American Car & Foundry Co. .....
American Fomon Co. 186
American Hammered Piston Ring Co....
American-La France & Foamite Corp....
American Radiator Co. .....
American Roller Bearing Co. .....
American Rolling Mill Co. .....
American Schaeffer & Budenberg Corp...
American Sheet & Tin Plate Co.....
American Steel Works .....
American Telephone & Telegraph Co....
American Well Works 183
Andrews Steel Co., The 170
Armstrong Bros. Tool Co. .....
Ash Grove Lime & Portland Cement Co..112
Athey Truss Wheel Co. .....
Axelson Machine Co. 93
Ayer & Lord Tie Co. .....

B

Baash-Ross Tool Co. .....
Babcock & Wilcox Tube Co., The.....
Badger, E. B., & Sons, Co. .....
Baker Oil Tools, Inc. 75
Baldwin Chain & Mfg. Co. .....
Barber Asphalt Co., The .....
Barco Manufacturing Co. 110
Barnickel, Wm. S., & Co. .....
Barnsdall Refineries, Inc. 96-97
Bartlett Hayward Co., The .....
Beaumont Iron Works Co. .....
Bendster Burner & Engineering Co.....
Bessemer Engine Co. 153
Bethlehem Steel Co. .....
Bigelow Liptak Corp. .....
Bignall & Keeler Machine Works.....
Blackor Co. 100
Black Wire Rope Co. .....
Borden Co., The .....
Braden Steel Corp. 6
Braun, C. F., & Co. .....
Brewster Co., Inc., The 22
Bridgeport Machine Co. 118-119
Bristol Co., The .....
Broderick & Bascom Rope Co. .....
Brown, Arthur C. 186
Brown Instrument Co. .....
Buda Co., The .....
Buckeye Traction Ditcher Co. .....
Buffalo Gasolene Motor Co. 163
Burt Mfg. Co. .....
Butler Mfg. Co. 167
Byers, A. M., Co. 24
Byron Jackson Co. 2-35

C

Cameron Tool & Supply Co. .....
Carbondale Machine Co. .....
Carey, The Philip, Co. .....
Caterpillar Tractor Co. .....
Central Alloy Steel Corp. 169
Central Tube Co. .....
Cessna Aircraft Co. 151
Chain Belt Co. .....
Champion Machine & Forging Co., The...
Chaplin-Fulton Mfg. Co., The 168
Chapman Valve Mfg. Co., The .....
Chestnut & Smith Corp. .....
Chicago Bridge & Iron Works 9
Chicago Pneumatic Tool Co. 127
Chicago Steel Foundry .....
Chisholm-Moore Hoist Corp. .....
Clark Bros. Co. 37
Classified Wants 132-133
Climax Engineering Co. .....
Colona Mfg. Co. .....
Columbian Rope Co. 129
Columbus Forge & Iron Co., The 186
Consolidated Ashcroft Hancock Co., Inc..
Continental Supply Co., The 38
Cooke Seal Ring 178
Cooper, C. & G., Co., The 23
Crane Co. 109
Crane Packing Co. .....

D

D. & B. Pump & Supply Co. 106
Darling Valve & Mfg. Co. 120
Dart, E. M., Mfg. Co. .....
Davis, G. M., Regulator Co. .....
Dearborn Chemical Co. .....
Delta Electric Co. 184
Detroit Graphite Co. .....
Dodge Brothers Corp. .....
Donovan Boiler Works, Inc. 161
Drane Humphreys Co., Inc. .....
Dresser, S. R., Mfg. Co. 51
Dunn Mfg. Co. .....
Du Pont de Nemours & Co., Inc., E. I....

E

Eagle-Picher Lead Co. 3
Economy Pump & Oil Tool Co., The.....
Edward Valve & Mfg. Co., The.....
Elliott Core Drilling Co. 171
Empire Oil & Refining Co. .....
Emsco Derrick & Equipment Co.....106
Engineering Research & Equip Co.....131
Ethyl Gasoline Corp. 29
Exchange Banks of Tulsa .....

F

Fenwick-Reddaway Mfg. Co. 186
Ferodo & Asbestos, Inc. .....
Fisher Governor Co. .....
Fisk Tire Co., The .....
Fiske, Leland E. 184
Foster Wheeler Corp. .....
Foxboro Co., Inc., The .....
Franklin Valveless Engine Co. 84-85
Frick-Reid Supply Corp. .....
Fulmer Manufacturing Co. .....
Fulton Iron Works Co. .....

G

Gardner-Denver Co. .....
Garlock Packing Co. .....
Gaso Pump & Burner Mfg. Co. .....
.....Inside Back Cover
General Electric Co. 28
Gilbert & Barker Mfg. Co. .....
Goodrich, B. F., Rubber Co., The 13
Goodyear Tire & Rubber Co.....173
Gott, H. P., Mfg. Co. 183
Goulds Pumps, Inc. 124
Grant Oil Tool Co. 116
Graver Corp. .....
Gray Processes Corp., The .....
Greene, Tweed & Co. .....
Greenspon's, Joseph, Sons, Iron & Steel Co. 113
Griscom-Russell Co. 20
Guiberson Corp. 103
Gulf-Caribbean Steamship Line, Inc.....
Gulf Refining Co. .....

H

Halliburton, Erle P., Co. 17
Halliburton Oil Well Cementing Co.....
Harbison-Walker Refractories Co. .....
Harrell, F. O. .....
Harrisburg Pipe & Pipe Bending Co.....
Haynes Stellite Co. .....
Hazard Wire Rope Co. 123
Heat Transfer Products, Inc. .....
Hercules Motors Corp. .....
Hercules Supply Co. 159
Heydrick Mapping Co. 186
Hill, Hubbell & Co. 90
Hills-McCanna Co. .....
Hinderliter Tool Co. .....
Hope Engineering Co. 12
Hough, Charles N., Mfg. Co. 172
Hughes Tool Co. 104
Humble Oil & Refining Co. .....
Hunt, Robert W., Co. .....
Hussmann Hotel 186
Hyatt Roller Bearing Co. 79

I

Imperial Belting Co. .....
Imperial Refineries .....
Imperial Royalties Co. .....
Independent Oil & Gas Co. .....
Ingersoll-Rand Co. .....
International Cement Corp. .....
International Composition Co., Inc. .....
International Creosoting & Construction Co. .....Back Cover
International Derrick & Equip. Co.....
.....Front Cover
International Harvester Co. of America..176
International Nickel Co., Inc., The.....
International Supply Co. 32

J

Jarecki Mfg. Co. .....
Jefferson Union Co. 18
Johns-Manville Corp. .....
Jones & Laughlin Steel Corp. 19
Jones, The S. M., Co. .....
Joubert & Goslin Mch. & Fdy. Co.....

K

Kansas City Testing Laboratory.....
Kaw Steel Construction Co. .....
Kellogg, M. W., Co., The 186
Kelly Company 155
Kelly, John Eoghan .....
Kennedy-Plumb Corp. 183
Kennedy Valve Mfg. Co., The .....
Kentucky Wagon Mfg. Co., Inc. .....
Kerotest Mfg. Co. 14
Key Boiler Equipment Co. 185
Kohler Co. .....
Koppers Co., The .....
K-W Ignition Corp., The 182

L

Landis Machine Co. .....
Larkin Co. .....
Layne & Bowler Co. 181
Leader Iron Works 174
Leschen, A., & Sons, Rope Co. .....
Lincoln Electric Co. .....
Linde Air Products Co. 31
Link Belt Co. .....
Longyear, E. J., Co. .....
Lorraine Corp., The 162
Lucey Products Corp. 180
Ludlow Valve Mfg. Co. 185
Lufkin Fdy. & Mch. Co., The .....
Lufkin Rule Co. .....
Lummus, The Walter E., Co. .....
Lunkenheimer Co. 165

Mc

McAlear Mfg. Co., The .....
McCord Radiator & Mfg. Co. 5
McEverlast, Inc. .....
McEvoy, J. H., & Co. .....
McIntosh & Seymour Corp. .....
McKee, Arthur G., & Co. .....

M

Mack International Motor Truck Corp...
Macwhyte Co. .....
Madison-Kipp Corp. .....
Magnolia Petroleum Co. .....
Mahoney-Ryan Aircraft Corp., The .....
Maloney Tank Mfg. Co. 164
Manzel Bros. Co. .....
Marion Machine Fdy. & Supply Co.....
Marsh Gauge Pole Co. .....
Martin-Loomis Corp. 166
Mason Regulator Co. .....
Meicher, A. F. 186
Merco Nordstrum Valve Co. 157
Metric Metal Works 64
Mettler, Lee B., Co. 83
Midwest Piping & Supply Co. .....
Miller, Max B., & Co., Inc. .....
Miller Combination Bailer & Pump Co...
Mine Safety Appliance Co. .....
Missouri Portland Cement Co. .....
Moore, Lee C., & Co., Inc. 87-88
Munn & Co. 184
Myers, F. E., & Bro. Co. 183

N

National Lead Co. .....
National Petroleum Engineering Co.....186
National Supply Co. 81
National Transit Pump & Machine Co.... 57
National Tube Co. .....
Natural Gas Equipment Co. .....
Naturaline Company of America .....
Naylor Pipe Co. .....
Neilan, Schumacher & Co. .....
Newton Process Mfg. Co. .....
New York Rubber Corp. 118-119
Norris Brothers, Inc. .....
North American Car Corp. 184
Northern Pump Co. .....
Novo Engine Co. .....
Nye Tool & Machine Works 7

O

Oakite Products, Inc. 174
O'Brien Steel Construction Co. 170
Ohio Injector Co., The .....
Oil Conservation Engineering Co., The...
Oil Country Specialties Mfg. Co., The....184
Oil Insurance Association .....
Oil Well Supply Co. 72-73
Oxweld Acetylene Co. 31

P

Page Steel & Wire Co. .....
Parkersburg Machine Co. 152
Parkersburg Rig & Reel Co. 111
Parsons Co., The .....
Patrick, R. S. 61
Patterson-Ballagh Corp. 33
Pattin Brothers Co. .....
Penberthy Injector Co. 59
Petroleum Iron Works Co. 36
Pforzheimer, Carl H., & Co. .....
Phillips Petroleum Co. 179
Pilley Packing & Flue Brush Mfg. Co...
Pittsburgh Equitable Meter Co. 71
Pittsburgh Steel Products Co. .....
Pomona Pump Co. 158
Portable Light Co., Inc., The .....
Powell, William, Co. .....
Power Piping Co. 172
Prescott Co., The 117
Pressed Steel Car Co. .....
Prest-O-Lite Co., Inc., The 31
Pure Oil Co. 34
Pyle National Co. .....
Pyrene Manufacturing Co. .....

Q

Quaker City Rubber Co. .....

R

Reading Iron Co. .....
Reading Steel Casting Co., Inc. .....
Regan Forge & Engineering Co.....
Reid, Joseph, Gas Engine Co..... 8
Republic Iron & Steel Co. .....
Republic Rubber Co., The 27
Republic Supply Co. 128
Riter-Conley Co. .....
Robinson Orifice Fittings Co. .....
Ross-Meehan Foundries Co. 184
Russell Mfg. Co., The .....
Ryerson, Joseph T., & Sons, Inc. 184

S

Safety Gas Main Stopper Co.....186
Shaffer, J. E., Co. .....
Shaw, S. F. .....
Shell Petroleum Corp. .....
Sinclair Refining Co. 143
Sivyer Steel Casting Co. 16
Skelly Oil Co. .....
Skinner, M. B., Co. .....
Smith, A. O., Corp. 10-11
Smith Engineering Co. 62
Smith Separator Co. 4
Smooth-On Mfg. Co. .....
South Chester Tube Co. .....
Southern Cornice Works .....
Southwest Air Fast Express, Inc..... 95
Southwestern Engineering Corp. 49
Spang & Co. 15
Spang, Chalfant & Co., Inc. 77
Spartan Aircraft Co. 99
Springfield Wagon & Trailer Co. .....
Standard Steel Works .....
Stanley Belting Corp. 183
Star Drilling Machine Co. .....
Staynew Filter Corp. .....
Steiner, George .....
Stockham Pipe & Fittings Co. .....
Stoody Co. .....
Stork Engineering Co. .....
Strom Steel Ball Co. .....
Strong, Carlisle & Hammond Co., The....
Sullivan Machinery Co. 177
Sun Shipbuilding & Dry Dock Co.....
Sure Shot Torpedo Co. .....
Swartwout Co., The 178

T

Taubman Supply Corp. .....
Taylor Instrument Companies .....
Templeton, Kenly & Co., Ltd. .....
Texas Power & Light Co. .....
Thermoid Rubber Co. .....
Timken Roller Bearing Co. 68
Tips Engine Works .....
Titusville Forge Co. .....
Titusville Iron Works Co., The .....
Toledo Pipe Threading Machine Co., The.177
Trimont Mfg. Co. .....
Trumble Gas Trap Co. .....
Tube Turns, Inc. .....
Tulsa Boiler & Machinery Co. .....
Tulsa Sheet Metal Co. 184
Twin Disc Clutch Co. .....
Twin-Flex Corp., The .....

U

Union Carbide & Carbon Corp. 31
Union Wire Rope Corp. .....
United Air Cleaner Co. .....
United Iron Works, Inc. .....
Universal Oil Products Co. 55

V

Vex Company 67
Victaulic Co. of America .....
Victor Balata & Textile Belting Co.....
Victor Welding Equipment Co. .....
Vogt, Henry, Machine Co. 114-115

W

Wagner Electric Corp. .....
Wailes Dove-Hermiston Corp. .....
Walworth Co. 1
Warren Petroleum Co. .....
Washburne, Chester W. 186
Waukesha Motor Co. .....
Western Gas Construction Co., The.....
Westinghouse Electric & Mfg. Co.....
West Texas Utilities Co. .....
Whiting, P. H., & Co., Inc. .....
Wico Electric Co. .....
Wickwire Spencer Steel Co. .....
Wieman-Kammerer-Wright, Inc. 175
Wilgus Mfg. Co., The .....
Williams, J. H., & Co. .....
Williamsport Wire Rope Co. .....
Williams Tool Corp. .....
Wilson Oil Tools Corp. 35
Wilson-Snyder Mfg. Co. 30
Wilson Welder & Metal Co., Inc. .....
W-K-M Company, Inc. .....
Wood Shovel & Tool Co., The .....
Worthington Pump & Machinery Corp...
Wright Mfg. Co. 25-26

Y

Yale & Towne Mfg. Co. .....
Young Engine Corp. .....

Z

Zwetsch, Heinzelmann & Co. .....

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TABLE OF CONTENTS

SPECIAL ARTICLES

Crude Situation Shows Improvement 41
By Andrew M. Rowley
Conservation movement progressing in Oklahoma, Texas and California. West Texas outlook is better.

A.P.I. Reconsidering Conservation 43
By A. E. Mockler
Division of opinion develops in General Committee.

Senate to Consider Leasing Policy 43
By Charles E. Kern

Curtail California Production 44
By L. P. Stockman
Reduction of 145,156 bbls. ordered. Kettleman Hills restriction.

New Invention to Measure Crooked Holes 44
By Thomas F. Smiley

West Texas Supply and Demand Equal 45
By James H. Dameron
Healthy crude situation with no new menace in sight.

Treating Emulsions Without Cost 45
By R. Van A. Mills
Using salt water at natural well temperatures.

Developments in Vapor Phase Cracking 46-47
By C. R. Wagner
Pure Oil Co. solves problems in modern Gyro units.

I.T.I.O. Well's Pay Horizon Puzzle 47
By W. A. Spinney
Deepening of hole apparently only way of determining.

Precision Attained by Orifice Meter 48
By Thomas R. Weymouth
Development of device for measuring flow of fluids.

Large Attendance at Short Meter Course 48

The Natural Gas Convention (Editorial) 50

Field Problems and Their Solution 78
Edited By Thomas F. Smiley

Commercial Manufacture of Helium 82
By Charles E. Kern

Relationship of Government and Oil 86
By Ernest R. Lilley, Sc.D.
Review of legal status of petroleum here and abroad.

Underground Surveys of Oil Wells 107
By Alexander Anderson
Engineers, geologists and production men interested in data.

Refining Crude From Dundee Sand 108
By W. F. Faragher and J. C. Morrell
Investigation offers practical solution.

FIELD OPERATIONS

Late Fields 52

Michigan 52
By Special Correspondent

North Texas and Panhandle 53-161
By James H. Dameron

West Texas 54-161
By James H. Dameron

Oklahoma 56
By W. A. Spinney

Kansas 58
By W. A. Spinney

North Louisiana-Arkansas 60
By D. H. Bancroft

Southwest Texas 63
By B. D. Stevenson

Gulf Coast 65
By Neil Williams

East Central Texas 65
By Neil Williams

Rocky Mountain Area 66
By Tolbert R. Ingram

Canada 66
By Victor Lauriston

California 69
By L. P. Stockman

Central West 74
By Whit

Kentucky-Tennessee 74

Eastern Fields 76
By D. S. Wakenight

REFINING AND MARKETING

Reduce Kerosene Prices in Oklahoma 42
By C. O. Willson
Market slumps throughout Mid-Continent. Export market controlling factor in gasoline situation. Cylinder stocks strong.

Natural Gasoline Manufacture 130

Chicago Refinery Market Firm 134
By J. B. Waldo

Eastern Tank Car Market Stronger 135
By A. E. Mockler

Practical Suggestions in Refining 136
By W. T. Ziegenhain

Brief Items for Petroleum Refiners 138

Technical Questions Answered 139
By Dr. C. K. Francis

Refinery and Crude Prices 140-141

Tank Wagon Quotations 142

Of Interest to Sales Departments 154

ARTICLES OF GENERAL INTEREST

The Advertisers' Index 39

Equipment and Supplies 80

Natural Gas Developments 82

Men Known in Oildom and Personals 105

Classified Want Advertisements 132-133

Oil Securities Market 144-145

Crude Petroleum Statistics 188

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Refinery Section Starts on Page 130

Crude Situation Shows Improvement

Highest daily average estimated total production in 1928, week ended Dec. 29, 2,585,844 bbls. Lowest in 1928, May 19, 2,338,241 bbls.

Conservation Movement Progressing in Oklahoma, Texas and California. West Texas Outlook Is Better

By Andrew M. Rowley

Highest daily average estimated light oil production in 1928, week ended Dec. 29, 2,158,134 bbls. Lowest in 1928, Mar. 3, 1,927,713 bbls.

Continued improvement in the crude petroleum situation is evident despite the big increase in production recorded last week. That increase was due chiefly to the opening of wells in the greater Seminole area in Oklahoma to obtain new figures on potential output upon which to base percentages for permitted production during the last half of April. It seems entirely probable a decrease of from 15,000 to 20,000 barrels in daily average production may be shown for Oklahoma during this week. Completions in the Santa Fe Springs Field in California accounted for the increase shown there.

The situation in West Texas looks much better with production and deliveries about balanced. Indications are crude will be withdrawn from storage in West Texas within a comparatively short time if the conservation movement is continued and the necessity of pinching in wells to prevent encroachment by water probably will result in the conservation plan being made effective for a longer period.

California started on Monday of this week to endeavor to hold production more nearly to market requirements with the goal set at a reduction in output of approximately 145,000 barrels daily. The entire industry is vitally interested in the success or failure of the movement in California. Should success crown the efforts there, the crude situation throughout the country will be materially improved.

Small refiners in the Oklahoma and Kansas area are finding it necessary to offer small premiums in order to procure their crude requirements. With the increased demand expected in order to supply spring and summer gasoline requirements, further strengthening of the crude market is expected.

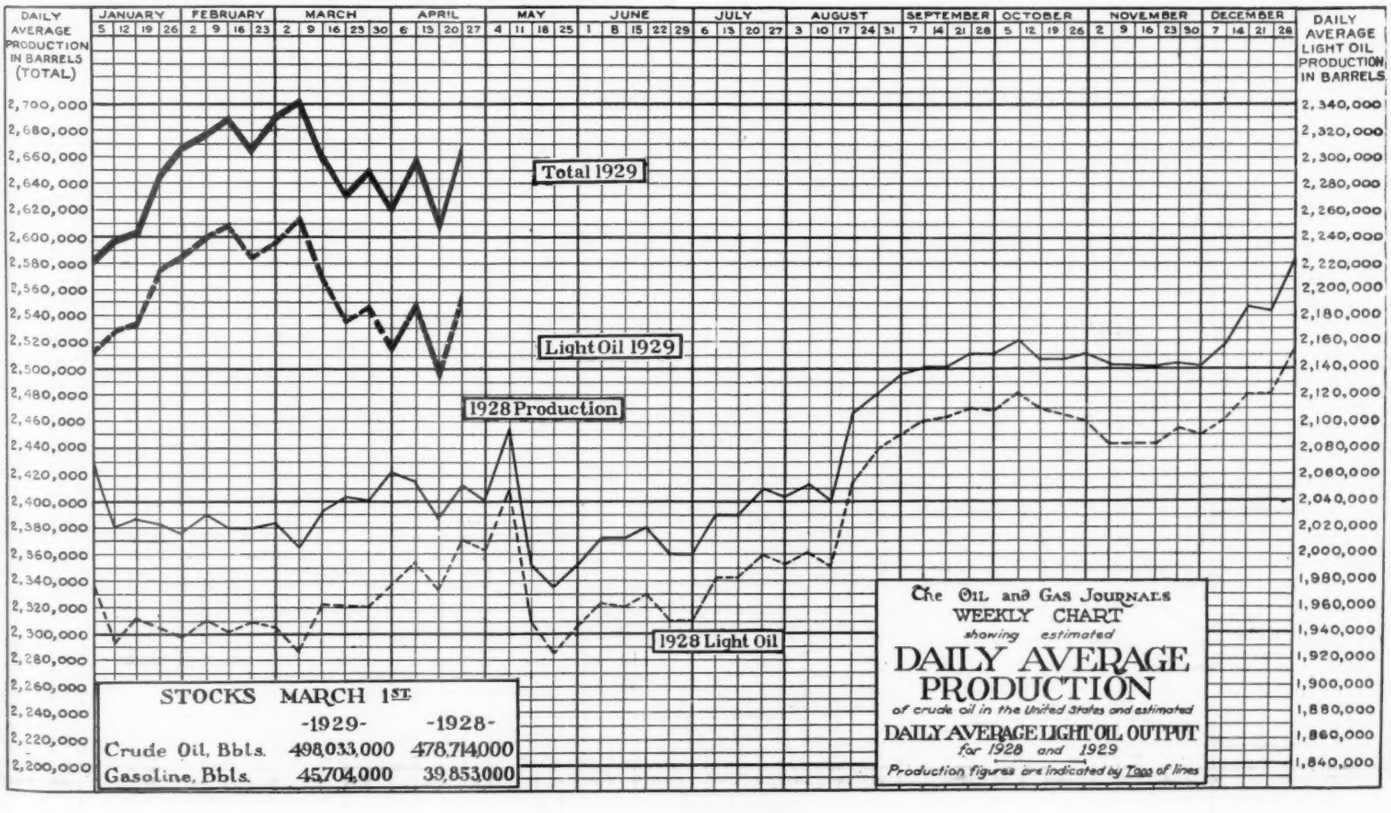
The conservation movement in the flush areas of the country—Oklahoma, Texas and California—will be continued, the meeting in New York this week of the directors of the American Petroleum Institute being merely for the purpose of deciding how the movement shall be conducted—whether by the Institute as a national organization or by the producers in the different states through state agencies.

PRODUCTION IN THE UNITED STATES

Estimated daily average production of light and heavy gravity oil in the United States for week ended April 20, and a comparison with the previous week follows:

	April 20		April 13	
	Light	Heavy	Light	Heavy
Oklahoma—				
Tonkawa	10,365	.....	10,090	.....
Burbank	21,115	.....	21,235	.....
Other Osage Fields	24,970	.....	25,015	.....
St. Louis-Pearson	109,720	.....	103,610	.....
Cushing and Shamrock	20,585	.....	20,615	.....
Bristow	19,635	.....	19,520	.....
Allen	26,240	.....	26,195	.....
Seminole	271,085	.....	255,095	.....
Northern Miscellaneous	114,620	.....	111,710	.....
Southern Fields	54,570	.....	54,760	.....
Total Oklahoma	672,905	.....	647,845	.....
West Texas—				
Hendricks	145,110	.....	143,097	.....
Yates	87,649	.....	87,989	.....
Remainder	122,058	.....	122,991	.....
Total West Texas	354,817	.....	354,077	.....
North Louisiana	29,710	5,915	29,775	5,835
Arkansas	25,065	48,425	23,660	49,135
North Central Texas	135,887	.....	135,688	.....
Texas Panhandle	64,325	.....	61,725	.....
East Central Texas	20,502	.....	20,391	.....
Kansas	108,745	.....	105,210	.....
Total Mid-Continent Area	1,411,956	54,340	1,378,371	54,970
Gulf Coast	.....	153,535	.....	154,597
Southwest Texas	.....	73,666	.....	72,979
Eastern	111,000	.....	110,500	.....
Rocky Mountain Area	72,955	.....	67,165	.....
California—				
Santa Fe Springs	161,000	.....	146,000	.....
Long Beach	189,000	.....	187,000	.....
Torrance	2,000	12,000	2,000	12,500
Huntington Beach	45,500	.....	45,500	.....
Elwood	30,000	.....	29,000	.....
Inglewood	14,500	11,000	14,500	11,000
Ventura Avenue	55,000	.....	54,000	.....
Seal Beach	50,000	.....	50,000	.....
Remainder of State	56,000	166,000	58,000	168,000
Total California	603,000	189,000	586,000	191,500
Total United States	2,198,911	470,541	2,142,036	474,046
Grand Total		2,669,452		2,616,082

→ **Total Increase, 53,370 Bbls.; Light Oil Increase, 56,875 Bbls.** ←



Reduce Kerosene Prices in Oklahoma

Market Slumps Throughout Mid-Continent. Export Market Controlling Factor in Gasoline Situation. Cylinder Stocks Strong

By C. O. Willson

With 7½ cents well established as the price to the trade on 58-60 U. S. Motor gasoline the refinery grades of gasoline for domestic movement occupied a strong position the first of the week in the Oklahoma (Group 3) market. Among the sellers it was predicted that the price would be boosted to 7⅝ cents before the end of the week. Evidence of the refiners' attitude was apparent in the refusal of several companies to take on business for the first 15 days of May at 7⅝ and 7¾ cents for the entire month.

Kerosene continues to decline in price. New business is slow. While most of the Oklahoma refiners are well taken care of for April, North Texas and Kansas refiners have been seeking additional orders at prices which have forced down the entire Mid-Continent price structure. The 41-43 water white grade was freely available in Oklahoma the first of the week at 6½ cents and was sold by North Texas and Kansas refiners on a Group 3 basis at one-eighth to one-fourth cent under this Oklahoma price.

Natural gasolines are holding their own the A and AA grades having shown practically no change since the first of the month. Fuel oil and gas oil business continues slow in Oklahoma, the competition of West Texas material being the outstanding factor in the Mid-Continent market. Distillate prices were again lowered with very little spot business reported. Steam refined cylinder and bright stocks are strong in Oklahoma and the rapid advance in Pennsylvania stock which continue throughout the past week will probably be reflected in part in Mid-Continent prices. The wax market has not shown any improvement.

Export Situation

The foregoing briefly summarizes the market situation in Oklahoma on Tuesday. On the whole the refiners are optimistic in regard to the refinery gasoline outlook in the domestic market for May.

The principal concern of the refiners is in regard to the export market for the higher gravities. During the past 10 days approximately 5,000,000 gallons of 390 and 375 endpoint material has been sold. Four million gallons of this material was taken by one refiner in Oklahoma and one Kansas refiner. The remainder was placed with North Texas refiners so there has been no general participation by Mid-Continent refiners in this export business.

The organization of the Export Petroleum Association, Inc. under the Webb act to which all the major factors in the oil export business belong has brought a condition in the Mid-Continent without precedent. The export association following its formation in line with the authority granted it under the Webb act established prices on the Gulf Coast for export movement. Export companies accustomed to buy from Mid-Continent refiners are obliged to carry on their business on a basis of these prices.

It has become apparent in recent weeks that these export prices on the Gulf Coast will have a very important bearing on the entire Mid-Continent domestic gasoline market. While Oklahoma and other Mid-Continent refiners during the past six weeks have advanced their price on U. S. Motor gasoline to the domestic trade approximately one-half cent the export market on all grades has not changed. The export prices on 390 and 375 endpoint gasolines—the two principal export grades—at the coast are 9¾ cents and 10 cents.

As a result the Oklahoma refiner for example finds himself in this position. He has advanced his U. S. Motor price to 7½ cents for domestic movement. With the export price at the coast unchanged the maximum price which an export company could pay for 375 endpoint material would be 8 cents and 7¾ cents for 390 endpoint. These prices are arrived at by subtracting the sum of the export rail rate of 1.45 cents per gallon from Oklahoma to the coast and the exporters handling charge, from the 9¾ and 10-cent prices at the coast.

With a 7½-cent price for U. S. Motor gasoline the average refiner in Oklahoma will state that he must have at least 8¼ cents for 375 endpoint material and a few at least believe that, based on present refining costs, the differential between the two should be 1 cent. During the past six weeks exporters have

(Continued on Page 152)

REFINED MARKET BAROMETER

Scattered advances materialized in the refinery gasoline market during the past week with no changes in export prices. Where weather conditions were favorable there was a noticeable improvement in the refinery movement. Natural gasolines were not so active the first of the week but prices for the most part were steady. Kerosene at practically all interior refineries was weaker a reflection of the fact that the heavy spring demand is near an end. Kerosene export prices were steady. The furnace oil season is practically at a close except in the northern states and refiners who are still offering this material usually have had to lower their prices. Bunker fuel oil prices were advanced in the Gulf Coast with stronger market reported from the East Coast. Steam refined stocks and bright stocks made from Pennsylvania grade crude oil continued to advance both for domestic and export movement. Other grades of stock also were strong. Gas oil was firm in the coastal areas and sluggish in the Mid-Continent and Middle West. Wax prices lower.

Mid-Continent—Kerosene movement slow in all areas and prices lower. Domestic grades of refinery gasoline strong. No change in high gravity gasolines for export. Fuel oil and gas oils weak. Furnace oil prices lower. Natural gasolines steady and movement slow. Cylinder stocks strong. Wax weak.

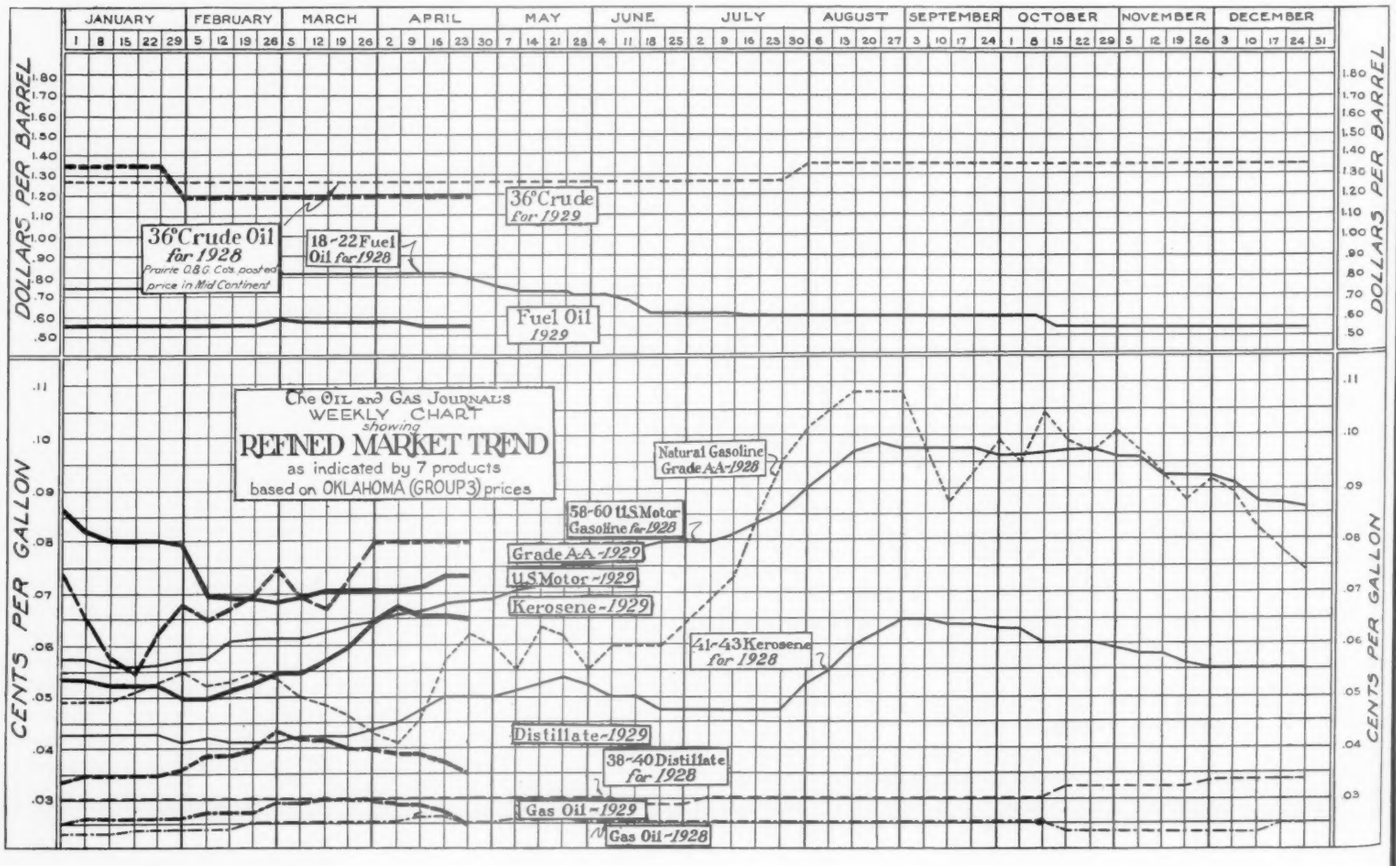
East Coast—Gasoline tank car market stronger. Sensational advance in steam refined stocks and bright stocks for export and domestic movement. Better outlook for fuel oil. Kerosene steady. No changes in petrolatum. Wax weak. Increasing demand for Diesel oil and prices steady.

Gulf Coast—Bunker fuel oil prices higher. Slow demand for neutral oils.

Chicago—Gasoline prices steady and movement confined largely to contracts. Kerosene prices lower. Fuel oil and gas oil dull. Furnace oil prices lower.

Pennsylvania—Sensational advance in steam refined stocks and bright stocks. Gasoline strong and prices higher. Fuel oil strong. No change in kerosene. Wax weak.

California—Prices unchanged.



A.P.I. Reconsidering Conservation

Division of Opinion Develops in General Committee's New York Conferences. Chairman Holmes Favors Action

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

NEW YORK, Apr. 23.—Complete abandonment of the American Petroleum Institute's plan for oil curtailment and conservation looms as a strong possibility on the eve of the meeting of the general conservation committee and the board of directors of the Institute here tomorrow. A number of important interests represented on the Institute's board who formerly favored the curtailment plan are understood to have radically changed their opinion since the adverse ruling of the Attorney General on April 3 on the Institute's restriction program. On the other hand, there is still strong sentiment in other quarters favoring the continuance of the conservation move with certain modifications to make the plan acceptable to both the Government and the industry.

Members of the general conservation committee met yesterday afternoon in the offices of R. C. Holmes, chairman, and a thorough discussion of the situation followed with no definite decision reached as to what the committee is to recommend to the board of directors at tomorrow's meeting. The general committee meets again today for further consideration of the conservation question.

State Action Discussed

While there have been no official statements regarding the progress of the meeting it is understood that Mr. Holmes is strongly in favor of continuing with the curtailment program and it seems certain that he will have important backing in this attitude at the formal meeting tomorrow. Chairman Holmes admitted that several prominent oil companies had suggested that the Institute's program be discarded in favor of state action in the principal producing states but added that it is impossible for him to predict what recommendations the committee will make to the board of directors until it has concluded its series of meetings. Owing to the wide divergence of opinion among members of the committee it is quite possible that agreement on the report to be tendered the Institute's directors will not be reached until tomorrow prior to the board's meeting.

Oil companies which have put forward opposition to the continuance of the conservation plan were basing their attitude on the fear that it may ultimately lead to government intervention in the industry and in time result in government price fixing for petroleum and its products. Such a contingency is one which all of the companies in the industry wish to avoid. In addition to the foregoing it is said that several of the leading companies affiliated with the institute and previously strong advocates of the curtailment program now fear as a result of the adverse government action on the conservation plan suggested by the industry last month that should the curtailment program be continued in its present form and scope the industry will run afoul of the antitrust laws.

Government's Attitude

Proponents of a continuance of the industry's efforts to regulate production contend that oppostiion to the institute plan is based upon a misunderstanding of the Government's actual attitude toward the industry. Conceding that the action of the institute in presenting its original curtailment plan to the Federal Oil Conservation Board was a "tactical error," these interests believe that the government authorities are still willing "to play ball" and that with slight modifications the original curtailment program may be carried through. It is inconceivable that the plan should be dropped at this stage, these interests argue, and deplore the "misunderstanding of the government position" which inspires such sentiment. Should the curtailment program be dropped now in favor of state action, these interests add, it will only be putting off the day when concerted action will be necessary and will put the petroleum industry in a position where it will have to begin all over again at terrible cost.

Holmes for Going Ahead

Chairman Holmes is believed to be strongly opposed to any cancelling of the industry's program at this time and to still hold to the views he expressed at the time the conservation board's disapproval of the institute plan was announced when he recommended that the conservation committee "carry on without delay as we have planned to do, in whatever ways and in every way that is open to us to do properly, and, if by chance, we are held to be acting in restraint of trade leave it to the courts to determine whether such restraint is in the public interest or not."

Thus the entire conservation program is still up in the air and no definite indication as to what may be looked for at the directors' meeting tomorrow is available. There is a possibility that the general conservation committee may recommend dropping the plan entirely as a project of the American Petroleum Institute and referring the entire matter to oil producing states for individual action. On the other hand there is just as strong a possibility that the committee may recommend to the directors a continuance of the plan developed at the March meeting with slight modifications to meet the views of the Federal Oil Conservation Board, or even the continuance of the plan in its original form.

There is also the possibility that the board of directors of the Institute may see fit to disapprove of whatever recommendations the general conservation committee may make and decide upon still another method of approach for combating the evil of overproduction of oil. It is evident that wide differences of opinion regarding the best plan of procedure for stabilizing the petroleum industry exist and no settlement of the question is looked for until the general committee and the board of directors have gone into the situation exhaustively.

Effect Abroad

One angle which some interests who are advocating discarding the curtailment program have evidently overlooked is the question of foreign co-operation in curtailment of production, particularly with respect to northern South America, principally Venezuela. The program of conservation developed at the March 27 meeting, here was designed to be worldwide in scope. Sir Henri Deterding, managing director of the Royal Dutch-Shell group, attended that meeting upon special invitation and sat in at the directors' consideration of the curtailment plan which the general committee had decided upon. Following the meeting Sir Henri announced that he had promised 100 per cent co-operation from the interests which he represents which not only have a large production in the United States but are leading factors in Venezuela as well. This promise was given on the understanding that the American petroleum industry would proceed with the curtailment plan laid down at that meeting.

Just how much in the way of 100 per cent world competition may be looked for in the event that the Institute's general conservation program is scrapped in favor of state action is a question which subsequent negotiations will have to straighten out. A number of leading interests who are favoring the continuance of the conservation plan under the national auspices of the American Petroleum Institute have not lost sight of this angle, however, and it will come in for its share of attention at tomorrow's meeting.

SENATE CONSIDERING LEGALITY OF PRESIDENT'S LEASING POLICY

By Charles E. Kern
Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Apr. 22.—The legality of the oil conservation policy of President Herbert Hoover under the leasing act of 1920 is to be considered by the Senate Committee on the Judiciary.

Senator King of Utah has introduced a resolution in the Senate directing the Judiciary Committee to make a full and complete inquiry and investigation of this subject.

It is not now known to what extent this investigation may go. As it is primarily for the purpose of having the committee give its interpretation of the law the inquiry may end when such an opinion is expressed if the committee decides to take such action. The hope of Senator King is that the committee will go on record against the legality of the President's action and he would then expect the President to act in accordance with the views of the committee. Should that not be done hearings may be sought for interested persons from the five states in which the President has closed the public domain to all oil exploration.

The resolution introduced by Senator King and referred to the Committee on the Judiciary concludes as follows:

"Be it Resolved, That the Committee on the Judiciary is hereby directed to make a full and complete inquiry and investigation as to the power and authority of the President to modify, suspend or set aside said leasing act, or any act of Congress, by executive statement or otherwise, or to deny to citizens of the United States the exercise of any rights granted to them by said leasing act; and also to inquire into the power and authority of the Secretary of the Interior to promulgate or enforce orders, rules or regulations designed to carry out said policy of the President announced on the 12th day of March, A.D., 1929, or to promulgate or enforce any orders, rules or regulations to modify, suspend or set aside the said leasing act, or to deny to citizens of the United States the exercise of any right or rights granted to them by the said leasing act, or by existing acts of Congress and said committee is also directed to make such further inquiries and investigations concerning the subject matter of this resolution as, in their opinion, is essential or desirable for a complete report of the Senate together with findings and conclusions in respect to such matters."

Nevada Interested

Representative Arentz has called personally on Secretary Ray Lyman Wilbur of the Department of the Interior submitting a typical application for a permit sought by a Nevada concern to prospect for oil on government land and requested a report on that application. Mr. Arentz opposes the President's policy of restricting oil production on government land. He stated that at the present time Nevada produced no oil but small business and professional men have spent money in prospecting. He says they have a right to produce oil within their own state instead of shipping it from a long distance and paying the freight rates.

Today Senator Walsh of Montana is asking the Judiciary Committee, of which he is a member, to give early consideration to the resolution of Senator King calling upon that committee for an investigation of President Hoover's oil conservation policy.

Sinclair and Prairie Merger With Stewart At Head Is Rumored

NEW YORK, Apr. 22.—According to reports from Chicago, Robert W. Stewart, former head of the Standard Oil Co. of Indiana, and Arthur W. Cutten are leading figures in a potential $1,000,000,000 oil combine which will take in a number of independent companies, using Sinclair Consolidated Oil Corp. and Prairie Oil & Gas Co. as a nucleus.

These reports are based on the rumor that Colonel Stewart will be selected to head the Sinclair Consolidated Oil Corp., as representative of the Cutten-Fisher, Blair-Gianinni interests, which are now understood to have control of the company.

Last October at the time of the election of Arthur Cutten as director, the directors of the Sinclair Consolidated Oil Corp. had authorized the sale of 1,130,000 of the 4,5900,000 shares of no-par common stock at $30 a share. The purchase price of some $33,900,000 is assumed to have been paid by the Cutten-Fisher interests, or at least by financial interests friendly to this group.

At the time the Cutten-Fisher interests bought into Sinclair so heavily, a Blair concern, the Petroleum Corp. of America, was being organized for the purpose of acquiring approximately $67,000,000 worth of stock in the Prairie Oil & Gas Co. and Prairie Pipe Line Co. The prices paid were reported $60 and $52 a share, respectively. Blair & Co. have been interested in other oil stocks during recent years, and as a result of their recent merger with the Giannini interests, these interests have been further expanded.

Cutten interests are reported heavy buyers of Pan American Petroleum & Transport Co. stock in the open market, and because of this it is believed that this company is being figured on as part of the large combine reported in process of formation. Pan American has long been considered as entirely dominated by Standard Oil Co. of Indiana.

NEW OIL TAX IN MICHIGAN

MUSKEGON, Mich., Apr. 20.—Gov. Fred W. Green, himself an oil operator in Arkansas and southwestern fields, signed the oil and gas severance tax law setting a levy of 2 per cent on the market value of production. The proceeds, which may reach $250,000 the first year, will be divided 40 per cent each to the State and township and 20 per cent to the county.

To Cut California 145,156 Barrels

California Operators Agree on Curtailment Plan Effective April 22. Kettleman Hills Restriction Approved

By L. P. Stockman

LOS ANGELES, Calif., Apr. 20.—California operators are busy completing final preparations and perfecting the mechanics of curtailment in order to eliminate any unnecessary delay in complying with Umpire van Deinse's General Order No. 1, issued under date of April 17. Actual curtailment was originally scheduled to become effective a few days ago but was postponed at the last moment due to the inability to complete final details. Statewide proration of production, however, will be definitely initiated April 22 and Umpire van Deinse expects to shut in 129,530 bbls. per day shortly thereafter. An additional 15,626 bbls. per day will be shut in as soon as practicable. Maximum curtailment will probably not be effected until along about the middle of next week, especially in flush areas where considerable caution must be exercised in the handling of flowing wells, some of which are flowing under pressure in excess of 1,500 pounds.

The conservation movement initiated by operators several weeks ago has for its objective the reduction of State production to the average daily output of 648,153 bbls. established during 1928. It is interesting to note in this connection that California's production for the month of March, 1929, totaled 24,324,729 bbls., and average 784,669 bbls. per day. This represents a drop of 11,785 bbls. from the February daily average of 796,454 bbls.

Text of Umpire's Order

Los Angeles, Calif.
April 17, 1929.

To the Producers of Petroleum in All Fields in California:

Gentlemen:

In order to give the earliest possible effect to a program whereby the total crude petroleum production in the State of California shall be held to 648,153 bbls. per day, the average for the year 1928, this General Order effective at 7 o'clock a. m., April 22, 1929, is issued.

The order covers all fields in the State except the San Joaquin Valley districts, against which an order will follow as quickly as its details may be worked out.

The order hereby given contemplates a reduction in crude petroleum production, based on the average for the month of February, 1929, of 129,530 bbls. per day. Upon issuance of order covering the San Joaquin Valley fields a further reduction of 15,626 bbls. will be accomplished and thereupon the curtailment will aggregate 145,156 bbls. per day.

Strict compliance with the order is requested of every individual producer and operator affected thereby, and such compliance is further stressed in the interest of the people of the State of California. The State's natural resources must be conserved and these voluntary measures undertaken by the oil industry to assist in perpetuating the life of the resources at its command will unquestionably meet with the hearty sympathy and approval of all public-spirited and far-seeing citizens of the State, as well as of its official representatives.

It is contemplated that general orders will be issued semimonthly as far as practicable, and at a suitable length of time before their effective dates.

May Produce 10 Days

New wells brought in within the period of the order hereby given will be permitted to produce uninterrupted for a period not exceeding 10 days, at the termination of which a special interim order applicable to such well, or wells, will issue, such order to fix the allowable oil production of such well, or wells, pending application of the next succeeding general order.

The subjoined tabulations disclose the estimated daily potential oil production of each lease or parcel of land included in each producing district as of the latest available data and the aggregate thereof constitutes the basis upon which the curtailments are computed. In this, the first general order, the "Current Allowable Production" from each lease or parcel of land equals the "Allotted Production." Subsequent orders will reflect the excess of production from any lease or parcel of land not held to its quota of "Allotted Production." Producers and operators will kindly be governed by the column "Current Allowable Production" for determination as to the quantity of oil to be produced as a maximum from each lease or parcel of land. All quantities stated are on "daily" basis of marketable oil in barrels of 42 U. S. gallons. The curtailments indicated are contemplated to be ratably applied to each individual well, but deviation in this respect is permissible provided such deviation does not work a hardship on neighboring producers and operators.

Very truly yours,
F. C. VAN DEINSE,
Oil Umpire for California.

Operators See Necessity

If Umpire Van Deinse succeeds in achieving the projected maximum State curtailment of 145,156 bbls. per day, California production will be temporarily reduced below the 1928 average. It is quite likely, however, that current completions, which will be permitted to flow unhampered for 10 days in order to secure a ratability, will keep the total State production in excess of the established maximum.

Practically all operators admit the necessity of curtailment in order to prevent a general demoralization and consequent inevitable price cutting. The absolute necessity of reducing production is quite evident from a survey of production and stock figures covering Pacific Coast territory for the first three months of 1929. Crude oil production during this period aggregated 70,011,375 bbls., the output in January being 23,385,939 bbls., February 22,300,707 bbls., and March 24,324,729 bbls. Total fluid stocks have increased 12,029,064 bbls. during the first quarter of the current year, 3,610,163 bbls. being accumulated in January, 4,330,547 bbls. in February and 4,088,354 bbls. in March.

Seriousness of Situation

The seriousness of the situation is also emphasized by a recent survey which indicated a probable crude oil production of 270,000,000 bbls. during the year of 1929 and addition to stocks of around 30,000,000 bbls., unless production activities were curtailed. The tremendous production of crude oil during the past 90 days has literally swamped refiners, with the result that 7,218,022 bbls. of light refinable crude have been placed in storage since January 1st. Stocks of gasoline have also accumulated, 2,544,513 bbls. being added to stocks during the past three months. Refiners have been liquidating their stocks of naphtha distillates, tops, for the past several years in order to eliminate double handling, but the large production of crude oil and normal seasonal decline in consumption has resulted in the addition of 422,743 bbls. of tops since the first of the current year. State production has continued at a relatively high rate for the greater part of April and a further substantial accumulation of crude oil, fuel oil, gasoline and tops is expected to have occurred during this period. The projected curtailment in production, which will definitely become effective April 22, will alleviate conditions to a very substantial degree, but the full effect of this proration will not be reflected to the maximum extent until late in the month.

Kettleman Hills Curtailment

The first definite step to initiate conservation work in the prolific Kettleman Hills Field of Kings County, California, was undertaken last Friday with the appointment of a committee to recommend a definite plan of procedure. The committee appointed consisted of Chairman E. D. Reiter, Miley Oil Co., secretary; Ellsworth McGowan, Kettleman Hills Oil Co., W. H. Berg, Standard Oil Co., W. L. McLaine, General Petroleum Corp., R. E. Ferguson, representing permit holders, J. H. Raney, Milham Exploration Corp., P. N. Longan and Milham Exploration Corp.

The resolution adopted by the Kettleman Hills operators stated that:

"Whereas, Honorable Ray Lyman Wilbur, Secretary of the Interior of the United States of American, has called this conference of the permittees and operators interested in government oil and gas permits in the Kettleman Hills district and has suggested that a plan be devised to prevent the waste that would follow the drilling up of that promising area,

Now, therefore, be it resolved: That this conference approves in principle the suggestion of the Honorable Secretary of the Interior and hereby authorizes the chairman to appoint a committee of seven to recommend a plan to effect the conservation of the oil and gas resources of that area."

Effect at Santa Fe Springs

Daily production at Santa Fe Springs has been declining for the past several weeks due to fewer completions and the normal settling of flush production from the Nordstrum and Buckbee zones. The production curve of this field started up again this week, however, due to the completion of several large wells in the O'Connell zone and will continue climbing indefinitely although the ascent may be interrupted at frequent intervals due to the cementing problem which has complicated matters and retarded completions because of the failure of cement to set on account of the high temperature of intermediate water. Field production will be artificially reduced next week in conformity with the statewide conservation movement which has for its objective the reduction of State production to the average daily output of 1928. This arbitrary cut anticipates a reduction in production at Santa Fe Springs to approximately 125,000 bbls. per day. This will be accomplished by mutually pinching in the production of all producing wells in the field.

The effectiveness of this program remains to be seen as the anticipated completion of new deep zone wells is bound to complicate matters and it is almost a foregone conclusion that field production will be consistently in excess of the established maximum of 125,000 bbls. daily. Development charts indicate the probable completion of numerous new

(Continued on Page 137)

NEW INVENTION DESIGNED TO SHOW HOLE'S DEVIATION FROM VERTICAL

By Thomas F. Smiley

Myron M. Kinley, of Tulsa, internationally known through his success in extinguishing oil field fires by the use of explosive gelatin, has perfected a device designed to provide a simple way to chart the inclination of well holes. He has applied for a patent for the device, which he has named the "Inclinometer."

Mr. Kinley says his device provides an effective method for promptly discovering when the drill pipe and drilling bit are deflected from a true vertical course by inclined formations. The inclinometer is placed in the drill pipe immediately above the bit where it records the inclination of the well hole during the drilling operation. With each withdrawal of the bit from the hole the conditions existing at the point of drilling may be noted. If it is seen that the hole is deviating from vertical, the drilling tools may be adjusted to meet the character of the formation and thus avoid excessive inclination.

The invention, according to Mr. Kinley, makes it possible also to record deviation from vertical in a drilled well at various levels. This can be done, the inventor says, by attaching the inclinometer to a cable and lowering it into the well tubing.

This new charting device is contained in a cylindrical water-tight housing. The top is provided with a bail to which a cable may be attached when the device is used in a completed well. The lower end of the housing is externally threaded.

Construction of Device

The recording unit itself includes a support frame and a vertical plate provided at its upper end with an upturned arm. The arm extends across the chamber, and fixed in this arm is an upwardly protruding pivot stud with a tapered end. The lower end of the plate is bent upon itself to provide an inturned arm, and an upturned bracket spaced from the side wall opposite the plate and co-operating

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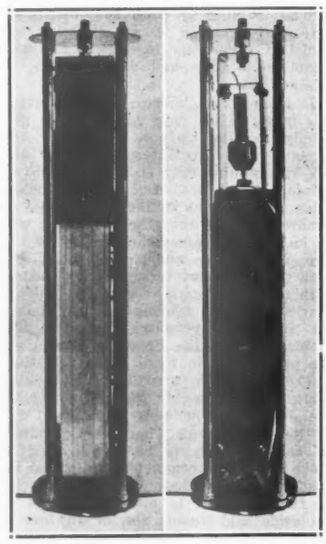

Two views of the inclinometer. At the left is shown recording paper which moves slowly under the pendulum and recording pen shown on the right. The paper is divided into degrees so that the pen markings show immediately how many degrees from vertical the hole may be at any point.

West Texas Supply and Demand Equal

Healthy Crude Oil Situation Exists With No Additional Pool Menace in Sight. Conditions in North Texas Good

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Apr. 22.—For the first time during the flush life of West Texas supply and demand are approximately in equilibrium as a result of runs to steel storage dropping to their lowest ebb. Estimates of crude oil movements in West Texas for the second week in April show runs to storage have dropped to 231 bbls. daily. This encouraging condition was brought about mainly by a big drop in daily average production. At the same time one of the major transporter's lines was not handling any oil through a system running to the coast.

With facilities available to handle in excess of 400,000 bbls. daily and a healthy tightening of the West Texas market it appears that heavy drafts will be made on West Texas storage during the summer, indications being that production will be held close to its present level. Several transporters have considerable West Texas crude stored on the coast and in central Texas farms. However, several others are not carrying a great deal of West Texas crude in stock at distant farms and these are expected to draw on stocks in the area.

This combination of factors has revived talk of price increases. Most students agree that West Texas has reached the healthiest stage of its life thus far from a market standpoint. That section of Texas is not the only one with a stiff market. The Wichita Falls district and Ranger district are both in a good condition with transporters soliciting connections. In the former district some pipe line companies have extended gathering lines to promising wildcats.

West Texas at present has a trunk line outlet of 340,000 bbls. The local refineries have been taking around 50,000 bbls. daily and the tank car shipments have been averaging around 28,000 bbls. daily. More refining capacity is being added to the area through the expansion work in old plants and by completion of plants now under construction. Shell Pipe Line Corp. recently completed its line to Houston and the Texas Pipe Line Co. expects to have its line to the same point completed sometime in July of this year.

The Gulf Pipe Line Co. is increasing its line capacity by looping it part of the way and putting in additional pumping units. Completion of this work and the Texas Pipe Line Co.'s project will add at least 75,000 bbls. to the line capacity in West Texas.

Below is given a report on the estimated movement of West Texas production for the week ending April 10 with a comparative summary table.

PIPE LINE RUNS
April 3 to April 10 (inclusive)
Runs Through Trunk Lines

Atlantic P. L. to Port Arthur, Tex...	36,232
Gulf P. L. to coast via Ranger, Tex..	24,239
Humble P. L. via Comyn, Tex.	41,048
Humble P. L. via Ingleside, Tex. ...	51,175
Illinois P. L. via Del Rio, Tex.	44,000
Magnolia Pet. via De Leon, Tex. ...	30,081
Pasotex P. L. to El Paso, Tex.	11,242
Shell P. L. to Healdton, Okla.	40,202
Total	278,219

Tank Car Shipments

Orient, McCamey, Tex.	135
The Texas Company, Crossett, Tex..	427
American Pet., Pyote, Tex.	6,580
Southern Crude O. P., Wickett, Tex.	16,339
Skelly Oil, Pecos, Tex.	3,132
Burford Oil, Pecos, Tex.	678
Total	27,291

Runs to West Texas Refineries

Amarillo Prod., Pyote, Tex.	2,076
Burford Ref., Pecos, Tex.	6,515
Col-Tex Ref., Colorado, Tex.	6,500
Cosden Ref., Big Spring, Tex.	6,851
Great Western Ref., Big Spring, Tex.	4,375
Humble O. & R., McCamey, Tex. ...	10,636
Midland Ref., Midland, Tex.	2,222
Tonkawa Ref. Co., Pyote, Tex.	3,653
Valley Ref. Co., Pyote, Tex.	3,212
Big Spring Ref., Big Spring, Tex...	2,315
Total	48,355

Summary

Pipe line runs through trunk lines..	278,219
Tank car shipments	27,291
Runs to West Texas refineries	48,355
Total daily disposition	353,865
Daily average production	352,966
Daily average to storage	899

Arkansas-Louisiana Market

Attractive freight rates from West Texas to El Dorado, Ark., refineries have improved the market and under the new rate effective late in March crude can be shipped in tank cars at 22 cents per 100 pounds. At present efforts are being made to bring this rate down to 20 cents per 100 pounds, placing it on a parity with the rate into western Louisiana.

Students of the situation in Louisiana and Arkansas are of the opinion that south Arkansas production will not meet the demands of the refineries in that State. Little help is expected from Louisiana. With the new freight rate in effect the possibilities of plants in Arkansas with uncertain crude connections being moved to other districts is almost pushed into oblivion.

Southern Crude Oil Purchasing Co. recently closed a contract with the Houston Oil Co. to supply a minimum shipment of 2,000 bbls. daily to the Arkansas refinery. This crude will be Winkler County oil and the price is reported to be 75 cents per barrel f.o.b. Wickett. Another indication of the trend of interest of Arkansas refineries in West Texas is in the purchase of Pure Oil Co.'s Hendricks Pool production by the Lion Oil & Refining Co. which has a refinery at El Dorado, Ark.

That operators are inclined to hold production down close to the 1928 level is demonstrated by the attitude of Yates Pool producers regarding the Mid-Kansas Oil & Gas Co.'s request for permission to run an additional 12,500 bbls. from the Yates Pool. On January 1 of this year the Texas Railroad Commission raised the allowed production of Yates to 100,000 bbls. daily. The transporters needs required only 87,500 bbls. of this amount at the time and that amount was designated as the allowed production of the pool. The operators, however, at their option could produce the additional 12,500 bbls. if the application were approved by the advisory committee.

Last week when the advisory committee considered the request of the Mid-Kansas company to run an additional 12,500 bbls. Humble Oil & Refining Co., Gulf Production Co., the California Co., and other producers in the Yates Pool objected to an increase in allowed production at this time. No definite action was taken on the matter at the time. W. S. Farish, president of the Humble company, and R. J. Berry, president of the Mid-Kansas company, will confer in New York early this week. It is thought

(Continued on Page 151)

Treating Emulsions Without Cost

Unique Method Devised in Tonkawa Field Utilizes Salt Water at Natural Well Temperatures To Make Clean Oil

By R. Van A. Mills
Petroleum Engineering Editor

A unique method of treating certain types of cut oil, more especially the emulsions formed from high gravity (42 degrees A.P.I.) Wilcox crude in the Tonkawa Field, Oklahoma, is being used by C. M. Copeland, production superintendent for the Comar Oil Co. at Tonkawa. No chemical reagents are used and the process is operated at practically no cost except that of installing the equipment. The method depends primarily upon using the salt water accompanying the oil as a dehydrating agent and also upon using the natural heat in the deep well fluids to stimulate the dehydration.

Figure 1 illustrates the simple manner in which this is done. After passing through gas separators, the oil, salt water, and emulsion enter the top of the separating tanks through the 4-inch lead line at the left and pass into a so-called flume through which they flow downward at the bottom of the flume.

The flume is made from gasoline drums welded together after the heads have been cut out, and extends vertically from the top to within a few feet of the bottom of the tank. There may be several of these in one tank and two or more lead lines may discharge into one flume. The introduction of the fluids at the top of the flume insures a minimum agitation of the column by gas which is allowed to escape at the top.

The warm salt water in the tank stands at an approximately constant level which is controlled by the gooseneck overflow at the right in Figure 1. As the fluids are discharged from the bottom of the flume and liberated into the tank the oil and lighter portions of the emulsion float upward through the warm salt water which has a temperature of about 90 degrees Fahrenheit. During this nonturbulent upward passage of oil and emulsion through the warm salt water a large part of the emulsion looses its water and is converted to clean oil. This clean oil accumulating above the water is drained off to the stock tanks.

Among the details in the construction of this type of separating tank, it is well to note that an open pipe extends upward from the gooseneck water overflow to admit air and prevent any siphoning of the water from the tank. As a guide in determining the height at which to set the gooseneck water overflow it has been found that in the 1,000-bbl. tanks being used by the Comar Oil Co., for every inch of difference between the height of the water overflow

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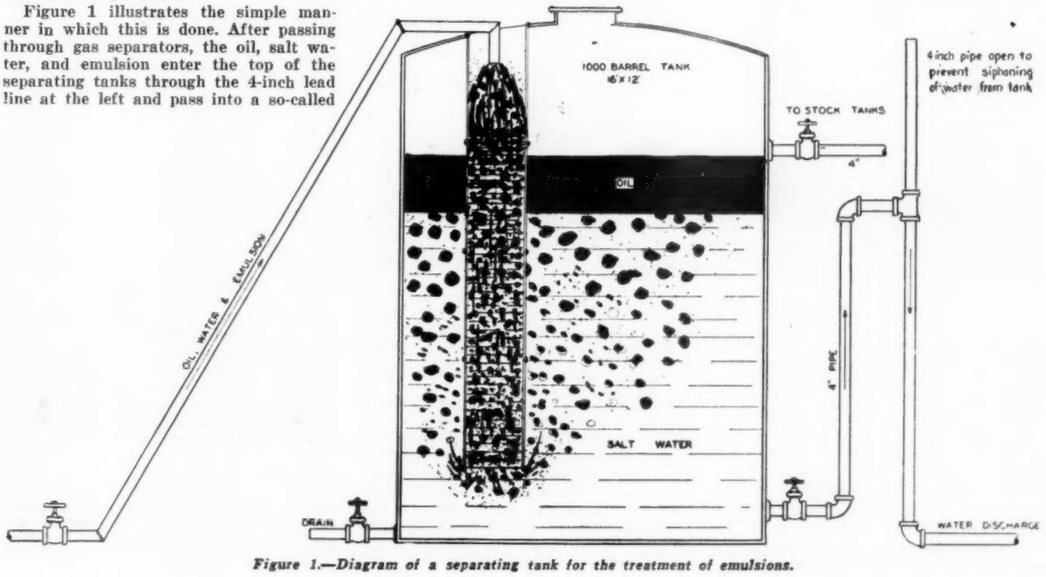


Figure 1.—Diagram of a separating tank for the treatment of emulsions.

Development in Vapor Phase Cracking

Pure Oil Co. Solves Many Problems in Modern Gyro Units. Motor Fuel Has High Antiknock Rating

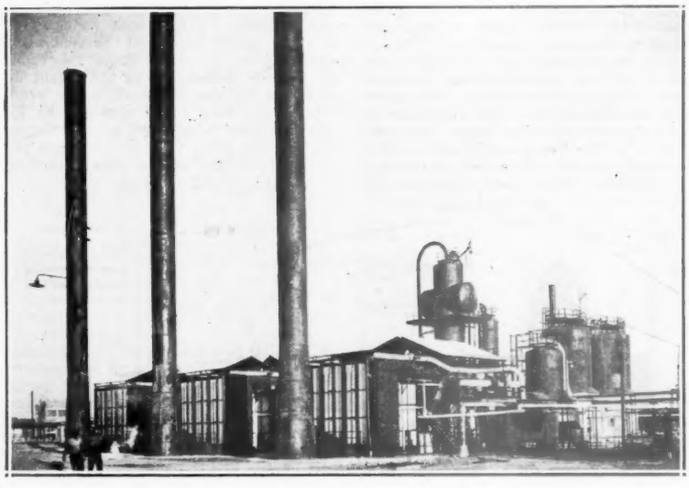
By C. R. Wagner*
Assistant Chief Chemist, Pure Oil Co.

Within the past few years a tremendous impetus has again been given to the development of methods for converting heavy petroleum hydrocarbon into motor fuel fractions suitable for use in present day motor cars. This development has been almost entirely along the line of cracking in the vapor phase, just as 10 years ago there occurred a vigorous exploitation of methods for cracking in the liquid phase. At that time the need was for more gasoline, because crude production was not keeping pace with the factory output of automobiles, and everyone was predicting speedy exhaustion of the nation's crude oil supply. Furthermore the public wanted a gasoline as nearly as possible like the straightrun gasoline recovered by stripping crude. Apparently no worse stigma could be attached to a gasoline at that time than to brand it as "cracked."

Today the situation is somewhat different. The refiner is in difficulty all of the time because his straightrun gasoline "knocks," and his customers are all clamoring for cracked gasoline. The change in attitude has been brought about by the development of the high compression automobile engine, such as the Hupp, Chrysler and many others. These engines, originally intended to conserve the nation's oil supply by giving the motorist more miles per gallon of gasoline, have grown very popular because of their power, pickup and general serviceability under quite varied conditions. Unfortunately for the producers of straightrun gasoline and most liquid phase cracked gasolines these engines "knock" severely when using ordinary gasoline. Such detonation is not only unpleasant to hear, but is hard on the engine as well, and furthermore under detonating conditions the engine does not deliver its maximum power, supply is so limited, this way was open to but few. The next obvious thing was to sell what is popularly known as "doped" gasoline, and unquestionably the wide distribution of such fuels has been largely instrumental in making the present day automobile a possibility. Many refiners could not see their way clear to such a course and turned to the manufacturer of low endpoint gasoline. The very wide distribution of this type of fuel speaks for its reception by the motoring public. Others, not willing to sell a "doped" fuel and reluctant to accept the reduction in yields attendant upon the manufacture of low endpoint gasoline, turned to the possibilities of vapor phase cracking.

Early History

To those of us who have always thought of cracking as having been accidentally discovered in 1861 by a careless stillman in a New Jersey refinery it comes as a decided shock to realize that Dalton in 1809 conducted rather extensive experiments on the decomposition of hydrocarbon vapors by means of electric sparks. Sixteen years later Faraday worked on the same problem and isolated benzene and several of the unsaturated hydrocarbons. In 1855 Professor Silliman made "oil gas" from petroleum hydrocarbons by high temperature cracking. His classic researches indicated many of the possibilities of petroleum chemistry, the realization of which in practice was not effected until comparatively recent times. Berthelot's work on the decomposition of petroleum at high temperatures was published prior to 1870, and Thorpe and Young began their work at least as early as 1865. In those early days, however, the demand was for lamp oil and not the light motor fuel fractions we prize so highly today. In 1862 we find Breitenlohner winning a grand prize at the London



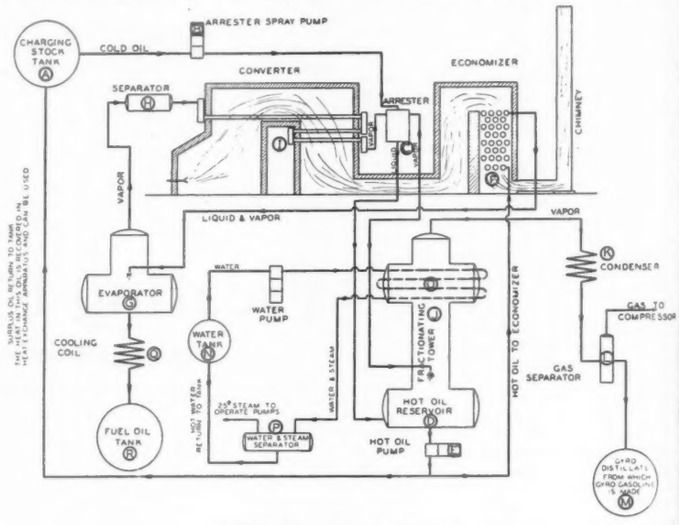
Gyro installation at Smiths Bluff, Tex., refinery of Pure Oil Co.

nor give the acceleration so much in demand. The refiner has therefore been compelled to resort to one of the following methods in order to keep his plant operating and retain his customers.

The first and most obvious way was to crack in present equipment selected charging stock that would give a product having a high antiknock rating, and fortunate were those who were able to secure such charging stocks. Since the Industrial Exposition for such a product produced by a high temperature vapor phase cracking process.

In the shortage of coal tar products which followed upon the early stages of the development of the dyestuff industry Nikiforoff found an incentive to develop his processes for the manufacture of aromatic hydrocarbons from petroleum. The growth of the American coal tar industry, however, relegated this process and others of a similar nature to the scrap heap, though they have an important place in the history of the development of the cracking industry[1].

It appears that Cowper-Coles in 1906 was the first person to design and operate a cracking process for the production of a light motor fuel. He passed heavy vapors through small metal tubes heated to high temperatures and then condensed the cracked vapors, and he appears to have noted some of the problems in vapor phase cracking which evidently escaped later investigators. caused a rupture at the point where the coke had deposited, the damage done being more or less dependent upon the location of the hot spot and the quantity of oil vapor in the system. All methods seemed to fail in the attempt to prevent the formation of this deposit and the consequent interruption of operation, and it is only within the last few years that any success has attended these efforts. It would be difficult to estimate the millions of dollars that have been



Flow sheet of Gyro process.

Noad, Sabatier, Testelin & Renard, Laing, Greenstreet, Lamplough, Turner, Hall and others rapidly followed the lead of Cowper-Coles, all of them strangely enough working in the vapor phase. The development of the Burton process of liquid phase cracking by the Standard Oil Co., (Indiana) for the manufacture of motor fuel abruptly changed the course of events in this field. Hall's process in England and Rittman's in America were able to make some headway during the war, but the return to peace caused their abandonment.

Reason for Failure

Examination of these processes and their operating conditions reveal several reasons for their failure. Perhaps the greatest stumbling block from the operating standpoint was coke formation. Tubes would plug up and burn out, towers and traps filled with carbon and had to be torn down for cleaning. Some of the inventors e. g., W. A. Hall, provided packed tower to facilitate the separation of this carbon and its ready removal from the system. The writer once saw a 10-inch vapor line plugged in this manner after 24 hours of operation so solidly that it had to be torn down and scrapped. Altogether aside from the inconvenience thus caused—and continuity of operation was out of the question—there was a very great hazard to life and property. This was particularly true in some of the systems where superatmospheric pressures were used. Carbon forming on the walls of highly heated tubes or chambers acted as an efficient insulator and allowed the steel to become heated above its softening point.

The pressure on the system then spent on this phase alone of the problem of vapor phase cracking.

Excessive Gas

Altogether aside from the difficulty encountered with carbon formation these attempts to crack in the vapor phase were doomed to failure because of the excessive gas formation. In nearly every case for each gallon of motor fuel distillate produced a gallon of gas oil was converted into fixed gas and coke. As recently as 1926 a well informed technical expert with years of experience in vapor phase cracking informed the writer that one must expect from a single throughput no more than 25 per cent motor fuel, 25 per cent gas and 50 per cent light fuel oil. This light fuel oil could be recycled, but in his estimation was scarcely worth it. It is small wonder that the oil industry looked askance at such processes, because these yields are so low that it would be economical suicide to produce motor fuel by such methods, unless the product were to receive a very large premium over ordinary gasoline. The size of this premium is already well established by the prices of current premium motor fuels, and in few instances does it exceed three or four cents per gallon. Unless a large city were near and the sale of the gas to the city were possible, the disposal of such quantities of gas would be a tremendous problem also. The proportions given above indicate that 90 to 100 cubic feet of gas would be produced for each gallon of motor fuel made.

A third thorn in the flesh of the person who desired to crack in the vapor phase was the high consumption of fuel. Vapor temperatures of 1,100 degrees Fahrenheit meant stack temperatures well over 1,000 degrees Fahrenheit under the best of conditions, and 1,500 degrees Fahrenheit was not unusual. The careful man could not view such waste without horror, and simple heat conservation remedies did

*Before National Petroleum Association, Cambridge Springs, Pa., April 25.

[1]For a very comprehensive resume of the situation the reader is referred to an article reprinted in Journal of Industrial and Engineering Chemistry by Lomax, Dunstan & Thole (J. Inst. Pet. Tech. 3, 36-120, 1916) December—J. Ind. Eng. Chem. 9, 879-902 (1917), and to Bulletin 114 of the U. S. Bureau of Mines.

not readily appear. Too high furnace temperatures seemed to increase coke formation, but failure to use the radiant heat from the combustion chamber forced the fuel costs still higher. The use of excess air to keep flame temperatures down caused such rapid oxidation of tubes that their life became a matter of days, or even hours.

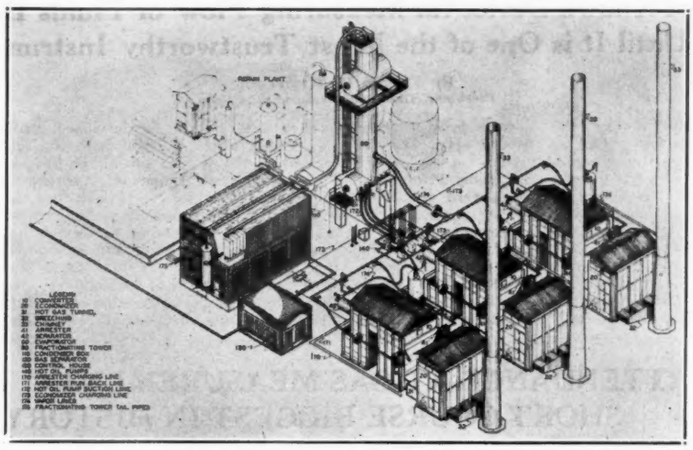
If anyone grew brave enough to face these three formidable antagonists, a fourth one usually disposed of him forthwith; i. e., treatment of the raw distillate so as to produce a satisfactory motor fuel. This distillate seemed to have everything wrong with it that any petroleum distillate was ever accused of. It was yellow, and seemingly averse to becoming water white; it had a terrible odor, everyone agreed; and it accumulated gum so rapidly that all despaired of ever being able to market it in the usual way. It did not respond in the usual manner to treatment with acid, as many refiners can attest. One reported treating a thousand barrels of such distillate in an open agitator with 5 pounds per barrel of 66 degree Baume acid. The oil temperature rose from 70 degrees Fahrenheit to 180 degrees Fahrenheit and the final recovery of motor fuel was about 60 per cent. Of course, a large part of this loss was polymerization loss, but the evaporation was heavy enough to make that part of the plant a considerable fire hazard for hours.

In spite of all these disadvantages, however, the finished motor fuel gave most remarkable performance in the new high compression engines. It could be blended with straightrun gasoline in equal proportions and the blend was as good or better than the 40 per cent benzol blends on the market. This blend gave smooth acceleration, unusual power, more mileage, less detonation and less carbon than most of the doped fuels or so-called premium gasoiines on the market. It is therefore not surprising that the popularity of these high compression engines caused a revival of interest in vapor phase cracking. It appeared possible to get an ideal motor fuel in this way, if the difficulties outlined above could be overcome.

It would make a long story, though it is an interesting one, to tell of the work carried on over a period of more than a decade in the endeavor to produce this ideal motor fuel on a commercial scale and on a paying basis. Fortunately for the industry the vision has now been translated into actuality. Today the Gyro Process Co., a pioneer in this field, has five plants operating and four more with construction well under way. The total capacity of these nine plants is 35,000 bbls. of gas oil per day, while licenses have been signed for an additional 75,000 bbls.

Gyro Process

The Gyro process is a low pressure vapor phase cracking process adapted to the handling of any grade of petroleum oil and producing therefrom a motor fuel having a high antiknock rating. Referring to the attached flow sheet, the charging stock is pumped from the charging stock tank (A) by means of pump (B) and delivered under approximately 100 pounds per square inch pressure to spray nozzles in the arrester (C). At this point the cold oil issuing from the arrester sprays reduces the temperature of the hot vapors which enter the arrester from the converter (I) at approximately 1,100 degrees Fahrenheit. The liquid from the arrester which consists of residuum from the charging stock plus any condensed materials from the converter passes by gravity to the hot oil reservoir (D). The vapors from the arrester, which consist of vaporized portions of the charging stock plus uncondensed products of the converter, pass to the fractionating tower (J). This fractionating tower is so designed that the distillate which is condensed from the vapors leaving the top of it will have a boiling range commensurate with the motor fuel desired. This boiling range is controlled by means of the refluxer (O) which may be arranged, as shown on the flow sheet, for the production of low pressure steam. The quantity of steam produced in this manner is more than enough to operate all of the pumps used in the process and to supply all of the required process steam. The gas from the gas separator (L) is led to a compressor for the recovery of its liquefiable motor fuel content by any suitable method.



Typical installation of Gyro process.

The hot oil reservoir (D) acts as a collector for all of the oil which enters the system which has not yet been converted into motor fuel or fixed gas. The hot oil pump (E) is controlled as to speed so that it will maintain a constant liquid level in the hot oil reservoir (D). The quantity of this hot oil delivered to the economizer (F) is regulated by an automatic rate of flow controller. This rate of flow is so maintained that the converter is constantly supplied with the correct quantity of vapor. The balance of this hot oil is returned to the charging stock tank (A) through either heat exchangers or coolers.

The portion of the hot oil which passes through the economizer leaves the economizer (F) at a temperature of about 700 degrees Fahrenheit and enters the evaporator (G). Here the fuel oil drops out as residuum and is removed from the system through the cooling coil (Q) to the fuel oil tank (R). Superheated steam is introduced into the system through perforated coils in the bottom of this evaporator in quantity not to exceed 3 per cent by weight of the vapors produced. The vapors and steam leaving the top of the evaporator pass through separator (H) which removes particles of entrained liquid. From the separator the dry vapors pass to the inlet of the converter (I) at a temperature of approximately 650 degrees Fahrenheit. In passing through the converter the temperature of the vapors is increased to approximately 1,100 degrees Fahrenheit and the conversion or cracking to lighter hydrocarbons takes place at this point. In this converter the vapors are distributed by means of the inlet header and passed through a number of tubes in parallel. In these tubes are inserted catalytic cores. From the outlet of the converter (I) the vapors pass into the arrester (C) which was described above.

Plant Yields

The following yields are on a volume basis and are taken from plant operating data and do not represent test run conditions. All figures represent averages for periods during which operating conditions were fairly constant, and

(Continued on Page 149)

I. T. I. O. Well's Horizon a Puzzle

Deepening of Hole Apparently Offers Only Likelihood of Determining Positively the Identity of This Formation

By W. A. Spinney

The name and the age of the deep producing formation in the Indian Territory Illuminating Oil Co.'s No. 1 fee in C SE SE Section 24-11-3w, the discovery well in the Oklahoma City Pool, are likely to remain problematical. If the hole should be deepened the identity of the pay horizon might be revealed. There is diversity of opinion among the geologists as to just what formation it is. However, certain lines of evidence point strongly toward one correlation over several other possible ones.

The location of the well was made by the company's geologists after a careful survey of the district had been made by its own men. Significant features revealed by this preliminary survey prompted the company to make more thorough geological investigation of the region. The work was in the hands of R. J. Riggs, manager of the company's land and geological department.

A number of geologists devoted several months to this work, recording surface indications and making geological maps. How thoroughly and accurately this work was done is shown by subsurface conditions definitely disclosed later by the drill and core barrel. The company was so favorably impressed by the geological report that it decided to confirm it in part by using a magnetometer, one of the several geophysical instruments which science has contributed to aid in the task of finding underground structural features pointing to the likelihood of petroleum deposits.

Other Wells Helped

The geological work was greatly aided by the wells that had been drilled in this district, such as Cromwell's No. 1 Thompson in SW cor. NE NE, Section 15-12-3w, and the Ramsey Brothers' No. 1 School Land, NW cor. SE Section 36-11-3w. When the Indian Territory well started neither of the above wells had encountered the Wilcox sand.

Instead of using cable tools to drill the well the company employed a rotary unit. Sample cores were taken of the formations below 3,900 feet. Some of the cores had showings of oil and gas. From these cores correlations can be made to determine the different formations when future wells are drilled.

This Indian Territory Illuminating Oil Co. test encountered Pre-Pennsylvanian rocks at the same point stratigraphically as the Cromwell's No. 1 Thompson, SW NE NE, Section 15-12-3w, which well had a normal section of Hunton lime, Sylvan shale, Viola lime and Simpson. The Hunton lime was expected below the unconformity. Therefore the cores taken for the first few feet from the I. T. I. O. test resembled certain parts of the Hunton lime markedly, excepting for the lack of microfossils or organic remains of any description. This was not surprising as dolomitization sometimes completely erases these structures and fossils locally. After several hundred feet of this same formation had been drilled without any change in lithology or any trace of fossils found opinion began to favor the dolomite of the upper Simpson and possibly the dolomite of the Arbuckle formation.

Sudden Changes Undergone

It will be well to note the sudden changes which have been experienced in the discovery well since it was completed. It has already produced over 550,000 bbls. of oil and is still averaging 3,370 bbls. daily. This fact alone must establish it as a real well regardless of the future. There is one factor, however, which tends to limit the supposed area of this pool, namely, the opinion held by many geologists that the discovery well is making its oil from the Arbuckle lime. The history of the Arbuckle lime production in other Oklahoma fields shows that these fields are rather limited in area.

After the well had been standardized and subsequently deepened, the flow of oil prevented the taking of good sam-

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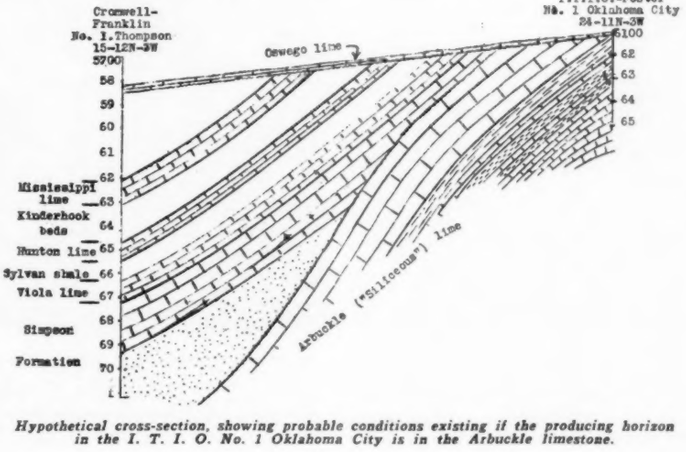
I.T.I.O. WELL PAY FORMATION STILL UNDETERMINED



Hypothetical cross-section, showing probable conditions existing if the producing horizon in the I. T. I. O. No. 1 Oklahoma City is in the Arbuckle limestone.

Precision Attained By Orifice Meter

Oldest Known Device for Measuring Flow of Fluids Developed Until It is One of the Most Trustworthy Instruments

By Thomas R. Weymouth*
President, Oklahoma Natural Gas Corp.

From the time when man first began to make measurements of physical magnitudes it has been known that when a liquid issues from a hole in the side of a tank, the quantity that will flow out in a given time is dependent upon the size of the hole as well as upon the height of liquid in the tank. Thus, the orifice is probably one of the oldest known devices for measuring flow of fluids. It is surprising, therefore, that its use has very largely been confined to open flows from one receptacle to another or from a receptacle into the atmosphere until about 20 years ago, when the first serious attempt seems to have been made to adapt it to closed flow in a pipe line.

The theory of its operation from the standpoint of thermodynamics had long been familiar to most engineers and much research had been conducted on the flow of water, steam and gas from an orifice, both open and submerged, but it never seemed to occur to anyone to use it as a closed meter. Today, however, it is probably more widely used than any other type of meter in measuring gases under pressures other than atmosphere or thereabouts.

In as much as the first work done in this country in the development of the orifice meter as now most widely used in the natural gas business depended upon the Pitot tube for the establishment of the orifice coefficients, a brief word about this instrument seems appropriate.

Origin of Pitot Tube

As is well known, the principle of the Pitot tube was discovered in the middle of the eighteenth century by a French physicist by whose name the instrument has since been known. The simple Pitot tube consists merely of a small tube bent so that its open end faces against the axis of flow of a stream of fluid whose velocity is to be measured. The impact of the flowing fluid against the end of the tip produces a pressure in the tube which is a measure of the velocity. About the year 1900 Forrest M. Towl and Eugene Coste conceived the idea of applying it to the measurement of gases in a closed pipe. They constructed a tube made from a piece of quarter-inch pipe bent to a right angle and inserted through the wall of a 4-inch pipe bored out to 4½ inches internal diameter and about 7 feet 3 inches long.

This instrument was calibrated by reference to a gas holder about 60 feet in diameter. They found that within the accuracy of their work the coefficient of the tube was practically constant for a range of differential pressures from 5 to 22 inches of water column. From this tube they calibrated others which were used for a time as standards for the calibration of commercial tubes.

Improvements Made

About the year 1906 B. C. Oliphant redesigned the Pitot tube and developed a very fine instrument which made provision for the removal of the tip for cleaning or repairs and its reinsertion in the pipe without disturbing the coefficient. A series of tubes ranging in diameter from 2 to 6 inches were built and the tubes from 2 inches to 5 inches, inclusive, were calibrated directly against a large gas holder in the city of Buffalo and the 6-inch tube was calibrated from these. These master tubes were then permanently installed in a station in Buffalo which was so arranged as to make it possible to use them either singly or in combination as a permanent standard for the calibration of any gas measuring device, and it was at this station that the modern orifice meter in America, as used today, had its actual beginning.

At this point a great many Pitot tubes of the Oliphant design were calibrated and sent to various gas companies for the commercial measurement of gas in large quantities and at high pressures. Among these secondary tubes were some that were furnished to Howell C. Cooper and installed in a testing station near Pittsburgh for the calibration of the orifice meter which he developed, while the meter which I developed was calibrated at the testing station in Buffalo.

Installed at Important Centers

The tubes which were sent out for commercial measurement were installed at important measuring centers of the larger gas companies in stations which had to be manned by attendants who obtained the records of the tube measurement by making observations every 15 minutes of the differential pressure as shown on a water manometer, and the static pressure either by an accurate Bourdon spring gauge or a mercury manometer. At that time there were no recording differential gauges on the market such as are available today.

Prior to 1910 all natural gas purchased in the field or delivered to large industrial centers was measured by means of displacement meters, either of the positive or the proportional type, and where the measurement was made under high pressures it was necessary to use volume recording gauges in connection with the meters. In the case of extremely high pressure measurement, these large meters were very unwieldy and heavy as well as very costly, and in many cases it was found very difficult to install them. Furthermore, they were subject to considerable derangement, as they could not usually be operated under proper conditions. The result was that an accurate measurement of gas was extremely difficult to obtain.

Erratic in Field

Moreover, it was found that while these meters could be tested in the shop and found to be registering with a high degree of accuracy under atmospheric pressure conditions, when they were set up in the field and operated under high pressure they became most erratic and I have found them to be as much as 30 per cent to 40 per cent in error under bad conditions. This led to so much uncertainty and dissatisfaction with the measurements obtained that it became apparent that some better means must be secured.

As early as the winter of 1903 and 1904 I was confronted with this problem and at that time turned to the orifice as the possible solution, and actually installed a flange in the fuel line leading to the boilers in a compressor station at Murraysville, Pa. Having no dependable coefficients of the orifice, however, nothing important came of this except the persistence of the idea that the orifice could be developed for this class of measurement, and in the period between this time and the year 1910, Mr. Cooper and I had many discussions of the feasibility of making use of the orifice for dependable gas measurements. As a result, we practically simultaneously developed our meters in accordance with our individual ideas.

Flange Pressure Taps Adopted

We both adopted the flange pressure taps for two principal reasons—the first being the very practical one that it permitted a simple and compact construction of a meter which could be confined in a small space, and the second being that while we knew that this would not give us the downstream pressure strictly at the vena contracta nevertheless it would not be far from that point and would take advantage of securing approximately the maximum differential pressure obtainable for any given flow, thus tending to increase the accuracy of measurement. In the determination of his coefficients, however, Mr. Cooper used the upstream pressure as his static, while I used the downstream pressure, resulting in entirely different coefficients for the two meters.

Mr. Cooper obtained his coefficient by calibration against the Pitot tube furnished to him from Buffalo and installed in the testing station which I have already mentioned, and he adopted the practice of actually calibrating every orifice which was used. I, on the contrary, at the Buffalo testing station calibrated orifices of all sizes from one-fourth inch to 6 inches in diameter and

(Continued on Page 148)

*Before sixth annual Southwestern Gas Measurement Short Course, Norman, Okla.

ATTENDANCE AT GAS MEASUREMENT SHORT COURSE BIGGEST IN HISTORY

By Special Correspondent

NORMAN, Okla., April 22.—More than 425 gas utility men from 16 states attended the sixth annual Southwestern Gas Measurement short course conducted April 16, 17 and 18, in the Engineering building at the University of Oklahoma. This year's registration, exceeding any previous enrollment here, constituted an increase of about 50 per cent over that of last year's school.

The College of Engineering conducted the three-day course with the assistance of the Oklahoma Utilities Association and the Corporation Commission of Oklahoma.

The following states were represented: Oklahoma, Texas, Kansas, Louisiana, Pennsylvania, Missouri, Arkansas, Ohio, California, Mississippi, Illinois, Connecticut and New Mexico.

Gas measurement equipment, having an aggregate value of between $20,000 and $25,000, was on display in the Engineering laboratories for educational purposes. Manufacturers who prepared exhibits for the laboratory instruction were: The Bristol Co. of St. Louis, Mo.; Chaplin-Fulton Manufacturing Co. of Pittsburgh, Pa.; Taylor Instrument Co. of Rochester, N. Y.; Sprague Meter Co. of Bridgeport, Conn.; Foxboro Co. of Foxboro, Mass.; Pittsburgh Equitable Meter Co. of Pittsburgh, Pa.; Refinery Supply Co. of Tulsa; Westcott & Greis, Inc. of Tulsa, and Metric Metal Works of Kansas City, Mo.

Fifty-two Technical Classes Held

Fifty-two technical classes were held with a gross attendance of 4,062. Men in every capacity of a gas utility had enrolled, including presidents, managers, vice presidents, construction engineers, superintendents, designing engineers, sales representatives, foremen, maintenance men, accountants, production men and service employes.

Prize awards totaling $50 were given to the seven best prepared summaries of the 1928 meter school held here. First prize of $15 was presented to R. O. Cox of the Lone Star Gas Co. Conrad A. Franks of the gasoline department of the Amerada Petroleum Corp. received $10 as the second prize. The remaining five prizes of $5 each were given to M. L. McCoy, of the Union Public Service Co. of Ottawa, Kans., R. T. Ramneaugh, Frank Jackson of the Ft. Worth Gas Co., T. O. Banta of the Lone Star Gas Co., and J. T. Thompson of the Southwestern Light & Power Co. of Chickasha, Okla.

Weymouth Gives Principal Address

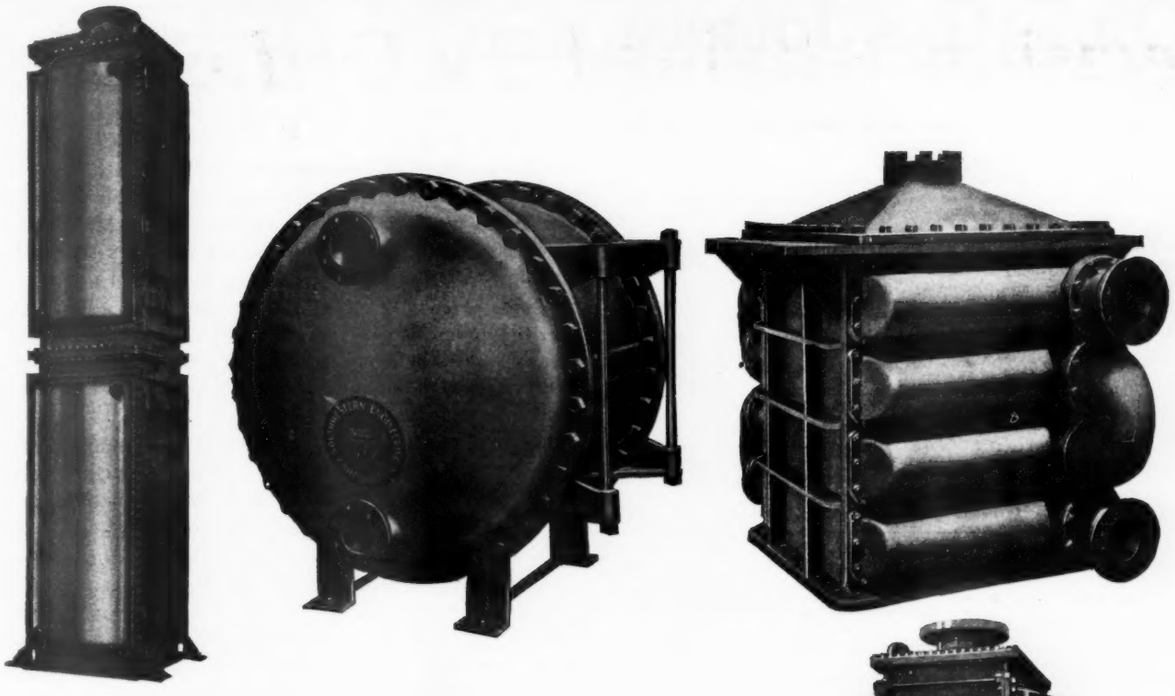
The feature technical address was on "Early Developments of Orifice Meter Measurement" by Thomas R. Weywouth, president of the Oklahoma Natural Gas Corp. Greater attention than heretofore was directed to fundamentals. One of the largest classes of the entire school was instructed by John C. Diehl on the fundamental principles of positive meters.

An added attraction of this year's school was wet gas measurement instruction. E. R. Schoenfeldt spoke on "Problems of Wet Gas Measurement by the Orifice Meter." A round table discussion was led by G. P. Bunn of the Phillips Petroleum Co. A large group attended the class on fundamental principles of regulators which was taught by A. D. McLean, chief engineer of the Pittsburgh Equitable Meter Co.

About 375 of the utility men attended the annual banquet held on April 17 at the McFarlin Memorial church, Norman.

CHAIRMEN GAS MEASUREMENT SHORT COURSE

Seated, left to right: R. H. Lusky, Corporation Commission of Oklahoma; G. P. Bunn, Phillips Petroleum Co.; D. A. Sillers, Lone Star Gas Co.; F. D. Frank, Cities Service Gas Co.; W. H. Carson, College of Engineering, University of Oklahoma; and Eugene Metz, Metric Metal Works. Standing, left to right: E. F. McKay, Oklahoma Utilities Association; A. J. Kerr, Pittsburgh Equitable Meter Co.; E. A. Clark, Oklahoma Natural Gas Corp.; C. B. Day, Consolidated Gas Utilities Co.; and B. P. Stockwell, Oklahoma Utility Co.



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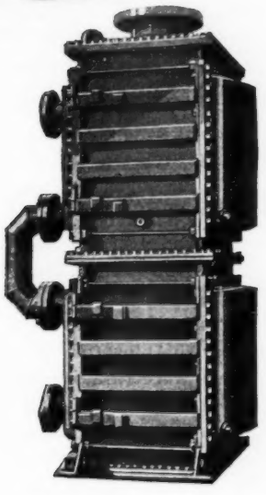

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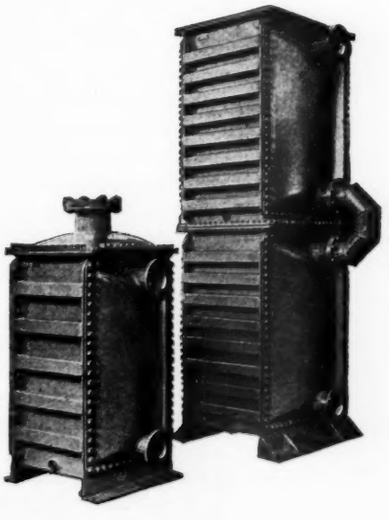

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MEMBER AUDIT BUREAU OF CIRCULATIONS

THE NATURAL GAS CONVENTION

The annual meeting of the Natural Gas Department of the American Gas Association, to be held at Kansas City, Mo., May 6 to 9, will be especially notable, coming in the midst of the greatest development the natural gas industry has ever known.

Ten years ago, just after the close of the war, natural gas men in the old fields of the East were thinking of but one thing—conservation of their fast dwindling supply.

The thoughtless wastes of the early days were being seen for what they were—irreparable blunders, the roadside flambeaux, typical of the general attitude toward the new fuel, the reckless burning of raw gas without any consideration for efficiency or economy, the waste-inviting cheap flat rate which encouraged extravagance in use, were recalled as a sort of joyride for the passing generation which the consumers of tomorrow would have to pay for in restricted use, greater cost and in many cases total lack of supply.

Gas companies, realizing the difficulty of maintaining a reserve, keenly conscious of the lesson taught by the experience of the pioneers, sought to arouse the interest of the public in more economical use and in prolonging the advantage of natural gas fuel.

The continual necessity of going farther afield for a supply meant increased cost of operation for the companies and, consequently, the necessity for higher rates to the consumers. At the same time the gas companies undertook to educate the public on the need for more efficient appliances which tended to offset to the consumer the necessary increase in maintaining a gas supply.

That policy has since ripened into the establishment of the laboratory of the American Gas Association and the listing of approved appliances for the benefit of consumers.

The feeling of mutual dependence thus created between the gas companies and the public led to better understanding which has been sedulously cultivated, a noticeable effect of this public relations work being the practical disappearance of the once familiar baiting of gas utility companies in political campaigns and in legislative bodies.

It was fortunate for the development of the new gas fields in the South and Southwest that there had been time for the industry and the public to profit through the earlier mistakes in the eastern fields.

The old hope that "there's plenty more where that came from," the popular notion that the supply was inexhaustible, had been dissipated and had been succeeded by authoritative estimates of the probable reserve and the employment of the highest engineering knowledge and skill in conserving that supply and obtaining its most efficient utilization.

The production, transportation and utilization of natural gas has become an expertly scientific and highly specialized industry. The new fields were, in the main, remote from great consuming centers. They had come as the result of the ceaseless search for oil and it was up to the natural gas industry to develop them.

Some places, like Kansas City, were getting gas but not enough. But the distances were greater than had been attempted in the East. Gas engineers believed it was only a question of equipment and the equipment men, builders of engines and compressors, and makers of pipe accepted the challenge.

The successful completion of the line from Amarillo to Kansas City and the line to Denver and Colorado Springs was quickly followed by other ambitious projects, no less daring.

The Monroe and Richland Parish gas fields in Louisiana lay within the widening scope of gas transportation as possible sources of supply for Memphis, St. Louis, New Orleans, and Birmingham, Alabama.

Lines to Salt Lake City from Wyoming and Colorado, to San Francisco from Kern County, are under way. There is talk of carrying natural gas from the Rocky Mountain area across to the Dakotas and even to St. Paul and Minneapolis. Omaha, Nebraska, even voted on a project to bring natural gas to that city.

In the Southwest the new fields have resulted in new lines to cities already getting natural gas or the extension of natural gas to cities that had never thought it possible. Among the new lines completed or projected are those to Houston, Laredo, El Paso, Beaumont and Austin, and even Monterrey, Mexico, is included in one project.

These great investments have been encouraged by the evolution of natural gas engineering, the development of more advanced equipment, and the establishment of the natural gas business upon a commodity basis commanding a price that justifies the enterprise.

What this enormous expansion of natural gas service will mean in industrial development and commercial growth can be imagined. It will undoubtedly be a very material factor in the upbuilding, not only of the larger cities to which lines have been extended but of all the communities along the lines.

These communities, unlike those in the early gas regions, welcome the new gas supply with a knowledge of its worth and from the start will be anxious to conserve it.

The natural gas industry enjoys this advantage over the oil industry—that its public has known what it is to feel the effect of a vanishing supply. That experience has altogether altered the popular attitude towards the gas industry. Even in the new cities now being served or soon to be served with natural gas public knowledge of the difficulties involved in making it available establishes a value that was unknown to the early users in the East who thought only, as so many do even yet of oil, that all that was necessary was to drill a hole in the ground and get an inexhaustible supply.

The truth is that the raw material, in almost any commodity of general use today, is but a fraction of the total cost. The coming meeting of the Natural Gas Department of the American Gas Association will be less concerned with production than with transportation and utilization problems and the intensely complex factors that enter into the supplying of natural gas between the well and the consumer.

It will be a gathering of executives, engineers, technicians and specialists whose labors are little known to the consuming public but whose combined effort maintains the supply of this invaluable fuel and is constantly enlarging the scope and increasing the efficiency of the natural gas industry.

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EIGHT PRODUCERS OF OIL OR GAS COMPLETED IN MUSKEGON AREA

By Special Correspondent

MUSKEGON, Mich., Apr. 20.—Eight new completions, all producers of oil and gas, were reported in the Muskegon Field. Two Dundee oil producers, one in Laketon Township and the other in Muskegon Township, were the largest completions. The Betty Jane Syndicate's No. 2 George S. Brand, SE SE, Section 11-10-17, Laketon Township, came in at 2,057-58 feet flowing 90 bbls. an hour. It is estimated good for at least 1,500 bbls. a day initial.

L. R. Henley and others brought in the second largest new oil producer in No. 1 S. E. Bortz well on the property of Jacob Koning, NW SW, Section 7-10-16, Muskegon Township. It started flowing at the rate of 70 bbls. an hour in the Dundee at 2,016-18 feet.

The Swastika Oil & Gas Co.'s No. 2-A Gilbert, NW NE, Section 7-10-16, Muskegon Township, came in at 2,023-27 feet with an initial flow between 35 and 40 bbls. an hour, estimated 750 bbls. a day. Witt & Nelson, Inc., brought in No. 2 George Fenner, NE SW, Section 11-10-17, Laketon Township, at 2,060-62 feet and estimated its potential daily flow at 500 bbls. with 500,000 feet of gas a day.

The Citizens and Lake Shore Petroleum companies completed No. 2 John B. Nichols, SE NW, Section 8-10-16, Muskegon Township, as a 10,000,000-foot gasser although they tried to drill it into the oil sands. Gas sands were topped at 2,035 feet and the well was completed at 2,050 feet. A well drilled by O. A. Daniels for the Paramount Oil Co. on the Martin F. Kieft lease, SW NW, Section 7-10-16, Muskegon Township, made 360 bbls. initial flowing 15 bbls. an hour by heads. Oil sands were from 2,023-33 feet. The Reliable Oil & Gas Co.'s No. 1 K. T. Murphy, NE NE, Section 12-10-17, Laketon Township, flowed over the mast when the upper Traverse pay sands were topped at 1,685 feet. The initial flow was estimated at 250 bbls. a day.

A new lower Traverse oil producer was completed for the Muskegon Oil Corp. as No. 2 on the John B. Nichols lease, NE NW, Section 8-10-16, Muskegon Township. It made 60 bbls. a day initial after a shot from 1,900-10 feet.

Two new locations were announced for Muskegon Township: Muskegon Oil Corp.'s No. 2 Daniloff, SW SW, Section 5-10-16, and the Swastika Oil & Gas Co.'s No. 3-B Gilbert, SW SE, Section 6-10-16.

Pay sands of the upper Traverse were encountered at 1,664 feet in Charlotte G. Marsh and others' No. 2 Albert Young, SE NE, Section 12-10-17, Laketon Township. The well pumped 120 bbls. the first day and 60 bbls. the second and was drilled another foot to 1,665 feet. Then it was shot and is now being cleaned out. It may be carried to the Dundee.

The best show of oil and gas encountered in any western Michigan wildcat immediately adjoining Muskegon County was struck in the Pennsylvania Oil & Gas Co.'s No. 1 Bert Snow, NW SE, Section 23-15-15, Leavitt Township, Oceana County.

At 2,678 feet the well had passed through a slight show of salt water and at 2,685 feet it had another show of oil one point higher in gravity with an increase of gas. It is believed by the operators that they have encountered the edge of a possible new western Michigan oil pool.

Another but smaller producer than the more recent wells was brought in last week in the Mount Pleasant, Michigan, Field following a shot of 60 quarts of nitroglycerin in the Chippewa Oil Co.'s No. 2 Jocelyn, SE SW, Section 12-14-3, Chippewa Township, Isabella County. It started flowing at the rate of 100 bbls. a day from the Dundee pay sands as the eighth oil well in 10 completions in the field. The Dundee was topped at 3,518 feet and the well was drilled to 3,590 feet before it was shot.

California Starts Curtailment; Plan Becoming Effective

By L. P. Stockman

LOS ANGELES, Cal., Apr. 23.—The California crude oil curtailment program became effective at 7 o'clock Monday morning and a general check made today indicated that the shutin had become 30 per cent effective.

Rapid progress is being made and it is thought that maximum curtailment will be attained later this week.

Within 48 hours after curtailment became effective, the Standard Oil Co. had reduced its daily production 6,000 bbls.; Union Oil Co. 4,000 bbls.; General Petroleum, 3,000 bbls.; Richfield Oil Co., 1,000 bbls. ,and the Associated Oil Co., 2,000 bbls.

Independent producers also are cooperating to the fullest extent and while in some cases field problems are delaying fulfilment of moral obligations these difficulties are being ironed out as fast as possible to facilitate early achievement of the goal.

The outlook is exceedingly promising for successful conclusion soon.

Oil Scouts and Land Men To Hold Annual Meeting in Wichita

Three hundred oil scouts of Oklahoma and Kansas are expected to attend the annual meeting of the Mid-Continent Oil Scouts and Land Men's Association to be held Friday and Saturday of this week in Wichita, Kans. Friday will be devoted chiefly to registration, renewal of friendships and exchange of views and information among the visitors. A banquet will be held Friday evening. The business session will be held Saturday. All sessions will be in the Broadview Hotel. A golf tournament will be in charge of J. J. Russell, Wichita, of the Mid-Kansas Oil & Gas Co. Entertainment for the wives of the visiting scouts and land men has been arranged.

Proposed consolidation of the Mid-Continent organization and the National Oil Scouts Association will be discussed at the business session. It is not believed that preponderance of sentiment in the Mid-Continent body favors amalgamation. R. T. Lutz, Dallas, Tex., chairman of the executive committee of the National Oil Scouts Association, will represent that organization in the discussion.

Fred J. Hill, of the Mid-Continent Petroleum Corp., president of the Mid-Continent association, will be toastmaster at the banquet. Mayor Charles S. Lawrence, of Wichita, will give the address of welcome. The principal speakers are to be L. E. Phillips, chairman of the executive committee of the Phillips Petroleum Co., and Ray M. Collins, umpire of proration regulations in the Seminole Field.

Rex L. Dawson, Carter Oil Co., is chairman of the board of directors of the Mid-Continent Oil Scouts and Land Men's Association; Simon Crites, Phillips Petroleum Co., secretary and treasurer; C. R. Welch, Shell Petroleum Corp., vice president, and Robert P. Brewer, Jr., Barnsdall Oil Co., second vice president.

Late Fields

GULF COAST

HOUSTON, Tex., Apr. 23.—Navarro Oil Co.'s No. 6-B Robinson, northwest flank of Blue Ridge, was completed Monday flowing 1,000 bbls. daily from sand at approximately 4,200 feet. Union Sulphur Co.'s No. 742 fee Sulphur came in flowing 1,000 bbls. daily after being deepened to below 2,900 feet. Humble Oil & Refining Co. and Valley Oil Corp.'s No. 3 Hardy, Raccoon Bend, came in Monday night and gauged 117 bbls. in the first 12 hours from sand at 3,216 feet. Yount Lee Oil Co.'s No. 29 McFaddin, Spindletop, is flowing 9,000 bbls. from sandy shale at 4,856 feet.

CALIFORNIA

LOS ANGELES, Calif., Apr. 23.—Wilshire Annex Oil Co.'s No. 3 Koontz, at Santa Fe Springs, came in flowing 9,865 bbls. of clean 34 gravity oil and 8,000,000 feet of gas daily from the O'Connell zone at 6,861 feet. Universal Consolidated's No. 10 Blanchard, another completion in O'Connell horizon, finished doing 5,370 bbls. clean 34 gravity oil daily from 6,690 feet. Associated Oil Co.'s No. 3 Green, finished last week has built up from an initial of 4,475 bbls. to 7,298 bbls. daily. All completions from now on will be permitted to flow unhampered for 10 days in order to determine rated production for use of the umpire in establishing amount to be shut in.

Barnsdall Oil Co.'s No. 4 Doty, Elwood Field, was completed doing 3,000 bbls. daily.

OKLAHOMA

Indian Territory Illuminating Oil Co.'s No. 1 Williams, C NE SW Section 24-11-3w, Oklahoma County, drilled to a total depth of 5,032 feet. The crew has plugged to 4,916 feet and has been bailing rotary mud. The fluid had been bailed down 1,800 feet when a good showing of oil was discovered on top of this mud; also a strong flow of gas was noticed.

The production of the Indian Territory Illuminating Oil Co.'s No. 1 fee, C SE SE, Section 24-11-3w, was 3,299 bbls. oil and 540 bbls. water on April 22. The highest water gauge of the week was on Sunday when it gauged 697 bbls. of water. The well acted the same as in previous weeks, slowly declining in oil pro-

(Continued on Page 152)

High Spots in Field News

KANSAS

Producers brought in by Shell and Phillips may be pool openers.

NEW MEXICO

Continental company's discovery in lower Pennsylvanian on Rattlesnake Dome continues principal interest.

NORTH LOUISANA-ARKANSAS

Ohio company well in eastern extension, Champagnolle, larger than discovery though not necessarily better.

Webster Parish has 40-bbl. pumper in heretofore gas area.

SOUTHWEST TEXAS

Houston Oil Co. completes biggest oil well in Refugio Field.

Edwards lime showing reported southwest of San Antonio.

NORTH TEXAS AND PANHANDLE

Completion of 700-bbl. wildcat south of Grayback Pool, in Wilbarger County, chief development of week in Wichita Falls district.

Panhandle production increased 2,000 bbls. by gains in Hutchinson County.

WEST TEXAS

First production in Coke County.

New pay in Noodle Creek, Jones County.

Ward County wells making better showing.

Deepest well makes new peak.

New proration meetings scheduled.

GULF COAST

Navarro company well, Blue Ridge, flows 1,000 bbls. Union Sulphur company well flows 1,000 bbls. after deepened.

Humble well, Raccoon Bend, gauged 117 bbls. first 12 hours.

Yount Lee company well, Spindletop, flowing 9,000 bbls.

OKLAHOMA

Sunday shut down reduced production of Seminole area 68,761 bbls.

Simms company Pottawatomie County well surrounded by short leases held by competing companies.

Daily average production for Seminole district for past week was 375,000 bbls.

Five wildcats in Oklahoma or Kansas are attracting unusual interest.

CALIFORNIA

Umpire orders curtailment of production 145,156 bbls.

Kettleman Hills operators approve Secretary Wilbur's suggestion to curb operations.

Wilshire company's No. 3 Koontz, Santa Fe Springs, flows 9,865 bbls., 34 gravity, with 8,000,000 feet of gas. Universal Consolidated's No. 10 Blanchard did 5,370 bbls. Associated's No. 3 Green increased to 7,298 bbls.

Barnsdall's No. 4 Doty, Elwood, completed doing 3,000 bbls.

Wilbarger Wildcat Makes 700 Barrels

Drilled in Midst of Group of Dry Holes on Magnetometer High South of Grayback Pool. Panhandle Production Up

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Apr. 22.—Completion of a 700-bbl. wildcat drilled in the midst of a group of dry holes and on a magnetometer high south of the Grayback Pool in Wilbarger County in the Wichita Falls district, was the most significant development in North Texas during the week.

Lewis Production Co. and Payne's No. 1 Waggoner-B, 660 feet south and 220 feet west of the NE cor. SE SW, Section 17, Block 4, H.&T.C. Survey, made 700 bbls. on a swab test from sand at 2,413-35 feet. Flowing by heads through 5⅜-inch casing the well made 200 bbls. in 18 hours. The last foot of drilling was in shale but no water was encountered.

This well was drilled on the strength of a magnetometer survey made last November by Carl C. Adams. It was spudded early in February but completion was delayed when a lengthy shutdown followed with a water shortage.

It is producing from the second Milham which yielded the big gushers in the north end of Grayback last fall. However, it is lower structurally than the big wells to the north.

Although the Wichita Falls district's drilling water supply was greatly increased by big rains the district is again facing another shortage. The water shortage does not offer any immediate menace but another rain would be greatly beneficial. Nearly 100 rigs in the territory in and around the Grayback Pool were shut down some time ago because of the water shortage.

Production of the Wichita Falls district increased 1,188 bbls. during the week due to increases in Jack, Cooke and Wilbarger Counties. Increases in the latter county again place Wilbarger as foremost in rank of the sweet oil producing counties in Texas. This production is expected to be maintained for several weeks through the completion of the scores of wells now drilling on inside locations and on locations in extension territory.

Increase in Panhandle

Panhandle's production registered a 2,600-bbl. gain as a result of increases in Hutchinson County and the holding of Gray County's production on an even keel. The most interesting developments in that area during the week were in Moore County. Two oil wells were completed in the Armstrong Pool but Phillips Petroleum Co.'s No. 1 Stella, NE cor., Section 192, Block 3-T, T.&N.O. Survey, Moore County, had a hole full of sulphur water at 3,460-63 feet.

This well was a disappointment in that it is only a mile from the old Morton producer which made 250 bbls. initially at 3,463 feet. The water in No. 1 Stella is to be cased off and the hole drilled to sea level in the search of production. If no other shows are found the well is to be plugged back to two showings higher up in the hole and shot.

The United States helium plant at Amarillo is making several test runs and will probably be running on a full schedule within a few days, according to the engineers in charge. Recently test runs have been at intervals to adjust the machinery and most of that work has been completed.

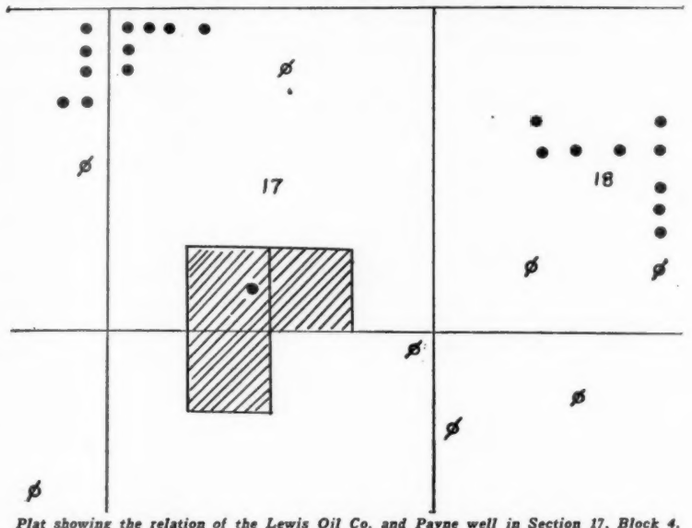
Two specially built tank cars costing $80,000 each are on the siding at the plant ready to transport the gas. These cars have a capacity of approximately 200,000 feet of gas. It will require about two weeks to fill the tank cars. Sufficient storage has been built at the plant to insure constant operation. The helium produced is about 98 per cent pure.

The Ranger district was without news of much interest during the week. Only routine completions were reported and the steady amount of new work is being carried on. With the scarcity of new production daily average of the district fell off 989 bbls.

WICHITA FALLS COMPLETIONS
Week ending April 20

Young County

Bratcher's No. 6 Edwards had an initial production of 12 bbls. at 448-88 feet. Bundy and others' No. 1 Brown was dry and abandoned at 1,055 feet. Butler & McCallister's No. 1 Thomas had an initial production of 70 bbls. at 999-1,001½ feet. Casey and others' No. 1 Boone was dry and abandoned at 601 feet. Continental and Underwood's No. 1 Campbell was dry and abandoned at 937 feet. Kimbrell & Lyles' No. 2 Dyer had an initial production of 5 bbls. at 606 feet. Lloyd Oil Corp.'s No. 1 Gredd was dry and abandoned at 525 feet. May Camp Drilling Co.'s No. 1 Prideaux had an initial production of 9 bbls. at 572 feet. Rennell and others' No. 5 Colvin had an initial production of 5 bbls. at 525-560 feet. Robertson Drilling Co.'s No. 1 Gillmore had an initial production of 5 bbls. at 566-588 feet. Its No. 3 Gillmore had an initial production of 5 bbls. at 565-79 feet and was drilled to a total depth of 588 feet. Walton and others' No. 3 Prideaux had an initial production of 7 bbls. at 502 feet. Fultz and others' No. 1 Scott was temporarily abandoned at 3,935 feet. Scott & Nance's No. 1 Goode was dry and abandoned at 2,275 feet.



Plat showing the relation of the Lewis Oil Co. and Payne well in Section 17, Block 4, Wilbarger County to the dry holes. Production to the north is in the Grayback Pool and to the east is the extension area. This location was drilled on the strength of a magnetometer survey made by Carl C. Adams. The shaded area is the three 40-acre tracts owned by the discoverers.

Wichita County

Venmex Oil Co.'s No. 15 Waggoner Brothers made 10 bbls. at 866-71 feet. Comar and Prairie Oil & Gas Co.'s No. 6 Bishop made 25 bbls. at 1,790-1,800 feet. W. H. Hammon's No. 1 Wighley was dry and abandoned at 1,825 feet. Hammon & Garrett's No. 2 E. McCarty was dry and abandoned at 1,853 feet. Panhandle Refining Co.'s No. 2 Burnett had a initial production of 60 bbls. at 1,400-07 feet. Petroleum Investment Co.'s No. 9 Fisher was dry and abandoned at 1,873 feet. Reiner & Bailey's No. 1 Michie pumped 410 bbls. first 24 hours and swabbed 287 bbls. in nine hours at 1,776-90 feet. Ryan Petroleum Corp.'s No. 1 Waggoner-A had an initial production of 3 bbls. at 1,809-14 feet.

ESTIMATED DAILY AVERAGE PRODUCTION NORTH TEXAS
Week Ending April 20

Panhandle District—	
Carson County	6,445
Gray County	28,640
Hutchinson County	26,690
Moore County	1,895
Potter County	...
Wheeler County	655
Total this week	64,325
Total last week	61,725
Increase	2,600
Wichita Falls District—	
Archer County	16,673
Baylor County	74
Clay County	459
Cooke County	5,950
Jack County	1,941
Montague County	7,047
Throckmorton County	638
Wilbarger County	27,254
Young County	6,741
Wichita County	26,902
Total this week	93,679
Total last week	92,491
Increase	1,188
Ranger District—	
Brown County	8,380
Callahan County	3,991
Coleman County	3,577
Comanche County	1,169
Palo Pinto County	406
Ranger	5,136
Shackelford County	13,226
Stephens County	6,323
Total this week	42,208
Total last week	43,197
Decrease	989
Grand total this week	200,212
Grand total last week	197,413
Increase	2,799

RANGER DISTRICT COMPLETIONS
Week ending April 20

Brown County

Humble Oil & Refining Co.'s No. 1 Armstrong found the oil sand at 1,202-18 feet, was drilled to a total depth of 1,220 feet and had an initial production of 50 bbls. Rosenbaum and others' No. 1 Newton was dry and abandoned at 1,202 feet. Green and others' No. 2 Hill was dry and abandoned at 1,270 feet. Kerr and others' No. 3 Boysen was drilled to a total depth of 1,747 feet, shot with 100 quarts at 1,590-1,747 feet and had an initial production of 500,000 feet of gas. McClung's No. 2

(Continued on Page 151)

WILDCAT OPERATIONS IN TEXAS PANHANDLE

Week Ended April 20

Company, well, farm, name, section and block—	Remarks—
CARSON COUNTY	
Empire G. & F. Co.'s No. 1 Armstrong, 330 ft. from S line and 330 ft. from E line of NW SE, Sec. 31, T.T.R.R Sur.	Drlg. 955 ft.
Empire Gas & Fuel Co.'s No. 15 Burnett, C NW Sec. 4, Blk 5, I.&G.N.R.R. Sur.	Drlg. 265 ft.
Gulf Prod. Co.'s No. 1-E Cooper, 330 ft. S and W of NE cor SW, Sec. 5, Blk. 9, I.&G.N. Sur.	Drlg. 2,620 ft.
Gulf Prod. Co.'s No. 6 Noel, 330 ft. S and 1,320 ft. E of NW cor. SW, Sec. 198, Blk. 3, I.&G.N.	Drlg. 2,530 ft.
Marland Prod. Co.'s No. 1 Burnett-L, 440 ft. S and 1,320 ft. NW NE cor. Sec. 79, Blk. 4, I.&G.N. Sur.	Drlg. 2,000 ft.
McElroy Oil Co.'s No. 1 Lewis, 330 ft. S and E of NW cor. SW NE, Sec. 115, Blk. 4, I.&G.N.R.R. Sur.	Drlg. 1,935 ft.
Morris et als' No. 1 Barnard, NW cor. SW SE, Sec. 44.	Drlg. 2,703 ft.
Spartan Oil Co.'s No. 1 S. Bednorz, NW cor. E½ NW, Sec. 202, Blk. 3, I.&G.N. Sur.	Drlg. 2,760 ft.
Skelly Oil Co.'s No. 13 Schafer, 330 ft. N and E of SW cor Sec. 88, Blk. 4, I.&G.N. Sur.	Bldg. rig.
Skelly Oil Co.'s No. 14 Schafer, 330 ft. S and W of NE cor Sec. 68, Blk. 4, I.&G.N.R.R. Sur.	Rig on ground.
The Texas Corp.'s No. 1 Quinn, 330 ft. from S line and 330 ft. from W line SE, Sec. 7, Blk. 9, I.&G.N.R.R. Sur.	Drlg. 360 ft.
Travis et als' No. 1 D. A. Harrel, C NE NE, Sec. 162, Blk. 7, I.&G.N. Sur.	C.O. 3,375 ft.
Ware et als' No. 1 Ware, 990 ft. S and 400 ft. E NW cor. Sec. 18, Blk. 3, A.B.&M. Sur.	S.D. 4,413 ft.
CASTRO COUNTY	
Colorado O. & R. Co.'s No. 1 M. Slemmons, SW cor. Sec. 73, Blk. M-17, B.S.&F. Sur.	Rig blown down.
Mystery Oil Co.'s No. 1 J. I. Crum, SE cor. NE, Sec. 333, Blk. M-6, S.K.&K. Sur.	S.D. 510 ft. for csg.
CHILDRESS COUNTY	
C. L. Sloane et al's No. 1 B. P. Smith, Sur. 49, F. P. Knott lands	S.D. 4,340 ft.
The Texas Co.'s No. 1 Smith, 100 ft. each way from NW cor. Sec. 174, Blk. H, W.&N.W. Sur.	T.D. 4,529 ft; cmtd. 5-in. 4,521 ft.
COCHRAN COUNTY	
Marland Prod. Co.'s No. 1 Slaughter-A, 330 ft. from W and 430 ft. from S lines, League 130, Carson County School land	Drlg. 1,020 ft.
COTTLE COUNTY	
Explin. Co.'s No. 1 Richards	S.D. 3,535 ft. for csg.
Explin. Co.'s No. 4 Matador Land & Cattle Co., C Sec. 46, J. H. Stephens Sur.	S.D. 3,227 ft.
Sun Oil Co.'s No. 1 T. B. Yarborough, 485 ft. S and 2,460 ft. E NW cor. Sec. 551, Blk. H, W.&N.W. Sur.	Drlg. 3,780 ft.
DONLEY COUNTY	
Beaudoin et als' No. 1 Ball, 1,075 ft. from N line and 985 ft. from E line, Sec. 22, Blk. E, D.&P.R.R. Sur.	Bldg. rig.

(Continued on Page 102)

First Production in Coke County, Tex.

New Pay in Noodle Creek. Better Showing in Ward County. Deepest Well at New Peak. Proration Meetings

By James H. Dameron
Fort Worth Bureau, The Oil and Gas Journal

FORT WORTH, Tex., Apr. 22.—Discovery of a new pool in Coke County and incidentally the first production in the county; discovery of a new pay in the Noodle Creek area of Jones County; improvement in wells in two Ward County wildcat areas and the continued rise in production of the world's deepest well, along with several other important field developments, made the past week a busy one for West Texas producers. Runs to storage decreased to a point near zero, indicating drafts on stocks in the near future if production is held around 350,000 bbls. daily. Apparently the efforts of producers to hold production at its present level will be successful.

Coke County is making a strong bid to be the first new West Texas County to be opened to production in 1929. Mid-Kansas Oil & Gas Co.'s No. 1 W. E. Lackey, 330 feet north and east of the SW cor. Section 272, Block 1-A, H.& T.C. Survey, in the northeast part of the county near the Nolan County line, has 2,200 feet of oil in the hole from sandy lime at 3,755-56 feet. The oil tested 39 degrees at 70 and is light green in color and sweet.

On a swab test during the past week the well produced 70 bbls. in five hours and filled up 100 feet in one hour. After that it was again swabbed and made 8 bbls. There is 170 feet of caving in the hole which is being cleaned out. A control head has been put on and two 500-bbl. tanks are on the lease. No water has shown up. Six and five-eighths inch casing was set at 3,451 feet shutting off a hole full of sulphur water found at 3,060-65 feet. Elevation of the test is 2,152 feet. The well made only 25,000 feet of gas. It is located on a 12,000-acre block owned by Mid-Kansas.

Because the well is so distantly isolated from the nearest production correlation is difficult with no control to give definite subsurface information. Some geologists believe the production to be coming from the base of the Cisco, while others are of the opinion it is on the top of the Canyon series.

Nearest production is 26 miles southeast in the Elm Creek Pool in Runnels County, 7 miles northeast of Ballinger. Forty-five miles to the northeast is the Noodle Creek Pool in Jones County and almost the same distance to the north is the Stephens Pool in Fisher County. If the new area is similar to the Runnels County production it will not be a market breaker. The wells in the Elm Creek Pool have never been high initial producers and the three producers are averaging 78 bbls. daily at the current writing.

New Pay in Jones County

Jones County's future prospects were enhanced when The Texas Company discovered a new pay in its No. 6 Carter, 220 feet from the NE cor. of the lease in Section 13, Block 19, T.&P. Survey. The well topped the Noodle Creek lime at 2,460 feet and at 2,740-43 feet a new pay was opened when 500 feet of oil rose in 30 minutes. The hole filled 1,500 feet with oil in 10 hours and after standing 16 hours it made 75 bbls. during a three-hour swab test. The hole was deepened to 2,765 feet and the well is estimated good for 200 bbls. daily.

This well is half way between the Tiner and Bickley Pools which are north of the old Noodle Creek Pool. The regular pay in those pools is around 2,495 to 2,530 feet. This new pay is correlated as the same horizon found in the Stephens Pool discovery well in Fisher County.

Ward County Wells Better

Gulf Production Co.'s No. 4 O'Brien, a little more than a mile northeast of Wickett in Ward County, is proving a better producer than many anticipated. The first real test of the well's caliber was made last week when it was connected to the Gulf company's new 4-inch line that extends from the main line at Monohans to the new pool. During a 12-hour run it flowed 1,388 bbls. at the rate of 115 bbls. hourly from a total depth of 2,631 feet.

Gulf company has made locations both to the north and south of the well to test out the territory. No. 5 O'Brien is to be drilled in the NW cor. SW Section 18, Block F, and No. 2 Hutchins Stock Association in the NE cor. Section 7, Block O, to the south. Both wells are being rigged.

Analysis made recently shows the crude from the O'Brien is not as good as first tests indicated. The gravity of the oil is 36.5 and it contains 1.1 sulphur. The sulphur content is almost as high as the average Hendricks Pool oil but the sulphur compound is reported to be different and not as destructive. The oil will yield 33.5 per cent of gasoline, according to the laboratory tests made by one refining company.

On down in the Shipley Pool in Ward County the hopes for bigger production in that area were buoyed when Atlantic and Delmar Oil Co.'s No. 1 Hayzlett, Section 17, Block 5, was shot with 80 quarts at 2,473 to 2,500 feet. During the first 24 hours the well made 516 bbls. The second day the production skidded to 205 bbls., but was up to 273 bbls. the following day. The water encountered at 2,502-04 feet has been exhausted.

Production of the well before the shot was around 55 bbls. It is an offset to the discovery well which quit flowing following the shot. Although the well's production dropped sharply after the first 24 hours the performance nevertheless gives the territory a little better outlook.

New Peak for Deepest Well

Texon Oil & Land Co.'s No. 1-B University, in the Big Lake Pool of Reagan County, is now flowing better than 100 bbls. of 56 gravity oil hourly. For the 24 hours ending April 20 the well went to a new high peak of 2,475 bbls. During the same period the gas production rose to 23,737,000 feet.

The next day the well characteristically declined and produced 2,427 bbls. and on the following day the production was 2,415 bbls. It is interesting to note that this well travels to new production peaks in four-day cycles almost without exception. Whenever it reaches a new peak production declines for a couple of days then starts upward and usually reaches a new peak on the fourth day.

The most interesting of the deep tests now drilling for the 8,525-foot pay found in the Texon company well is Kingwood Oil Co.'s No. 1 Suggs in Irion County, which is drilling in black lime at 6,105 feet. This well had shows at 3,368 feet, 5,480 feet and 5,660 feet.

Pecos County is again drawing attention in another wildcat, this being Perren and others' No. 1 H. J. Eaton, 150 feet each way from the northeast and northwest line of Section 27, Block 3, H.&T.C. Survey. At 1,502 feet the well made 18,000,000 feet of gas and blew the tools up in the hole 80 feet where they were stuck, causing a fishing job which lasted a week. Tools are now out and casing is to be set to shut off salt water coming from below the 8¼-inch casing at 1,120 feet. Negotiations were reported to be under way to pipe the gas from this well to Fort Stockton to supply that town.

Crockett County Producer

Moncrief and W. W. Donnelly and associates' No. 1, J. S. Todd, NE cor., Section 35, Block WX, G.C.&S.F. Survey, central Crockett County, looked like a producer during the past week when the well encountered its first gas at 1,337 feet, and oil at 1,365 feet. It has been drilled to 1,381 feet with an increase in oil, standing with 300 feet of oil in the hole. Pipe will be set at 1,381 feet to shut off this pay in order to drill deeper to test it. If water is encountered when it is deepened, it will be plugged back and shot.

This well looks good in the present state with prospects of making a commercial producer, but as several other tests in this area have shown up with considerable gas and oil and later failed, operators are skeptical regarding the possibility of this test. It is an interesting showing, however, watched by a considerable number of individuals and companies who still have faith in Crockett County producing another field.

Glasscock and Roberts

A number of good shows were encountered in several wildcat tests on the McDowell ranch in Glasscock County, but the test being drilled by the World Oil Co. in its No. 1-C McDowell, 1,650 feet south and 2,310 feet west of the NE cor., Section 21, Block 34, T-2-S, T.&P. Survey, looks as if the lime would be found high, around 2,200 feet, somewhere between 250 and 400 feet higher than the former tests. At present the well is shut down at 2,156 feet in red rock. Elevation is 2,544 feet.

A recent survey made in the Roberts Pool in southern Howard County and northern Glasscock showed that 46 of the 63 3,000-foot zone producers were making water. The water percentage ranged anywhere from 2½ per cent to 90 per cent with the majority of the water wells showing 50 to 90 per cent water. The Bureau of Mines is making a thorough study of this field. Engineers from that branch of the Government entered the field during its early life and have a complete record of each well. It is reported the study in this field will be the most exhaustive yet made because of the past history engineers were able to obtain by being on the ground during the early life of the development.

Lion-Pure Purchase

Another big production deal has been closed in Winkler County but the terms of the deal have not been learned. Lion Oil & Refining Co., El Dorado, Ark., purchased the producing properties of the Pure Oil Co. in the Hendricks Pool. Pure company has four producing leases in Hendricks on which 39 wells with a combined potential production of 278,803 bbls. have been drilled. At the present time the company is permitted to produce 13,263 bbls. under proration. Lion company owns a refinery in El Dorado and recently reduced freight rates place the company in position to use Hendricks crude advantageously.

The Texas Pipe Line Co. has completed its line from Winkler County to Jal, N. Mex., and is now building a pump station in Jal. One 55,000-bbl. tank has been built and another is nearing completion. A communication system was completed several weeks ago.

The same transporter is 95 per cent through with its line running south from Winkler County to Iraan, Tex., in the Yates Pool. This line goes through the Church and Fields Pool and the McCamey district. This system goes on to tidewater, terminating at Houston. The

(Continued on Page 150)

WILDCAT OPERATIONS IN WEST TEXAS

Week Ended April 20

Company, farm and location—	Remarks—
ANDREWS COUNTY	
Deep Rock Oil Co.'s No. 1 Hostetler, 2,310 ft. N and W of SE cor. Sec. 20, Blk. A-46	Top salt 1,890 ft.; set 8⅛-in. casing 2,790 ft.; top lime 4,297 ft.; drlg. 4,342 ft.
Mid-Continent Oil & Gas Co.'s No. 1 Fisher, 1,320 ft. N and 200 ft. E of SW cor. Sec. 5, Blk. A-36	Total depth 1,120 ft.; straightening crooked hole.
BORDEN COUNTY	
Gibson & Johnson's No. 1 Higginbotham, middle of S line of Sec. 8, Blk. 31, Twp. 3n, T.&P.R.R. Sur.	Drlg. 1,895 ft.
C. E. Hyde et al's No. 1 D. H. Beal, C NE Sec. 14, Blk. 31, Twp. 3n, T.&P.R.R. Sur.	Drlg. 2,900 ft.
Teas & Wheeler's No. 1 Long, 1,320 ft. N and E of Sec. 27, Blk. 30, T.&P. Sur.	Location.
BREWSTER COUNTY	
E. W. Bateman et al's No. 1 Nevill, 2,000 ft. from S line and 1,000 ft. from W line of Sec. 64, Blk. 13, G.H.& S.A.R.R. Sur.	Cleaning out 1,955 ft.
Brewster Oil Co.'s No. 1 fee, 2,640 ft. S and 2,598 ft. E of NW cor. Sec. 45, Blk. G-15, G.C.&S.F.	Total depth 1,505 ft.; bad hole.
Cowden & Bowser's No. 1-A Jackson & Harmon, Sec. 1, Blk. 331, T.C.R.R. Sur.	Set 8-in. 1,530 ft.; shut down 2,000 ft.
Forrest Oil Co.'s No. 1 Skinner, C SW SE Sec. 100, Blk. 2, G.C.&S.F. Sur.	Shut down 1,500 ft.
J. M. Hickey's No. 1 Jackson & Harmon, NE cor. Sec. 182, Blk. 9, G.H.&S.A. Sur.	Shut down 1,150 ft.
Johnson & Weekly's No. 1 Jackson & Harmon, C Sec. 104, Blk. 10, G.H.&S.A. Sur.	Drlg. 1,005 ft.
Van McPhail's No. 1 McIntyre, SE cor. Sec. 59, Blk. 352, 7 mi. S of Alpine	Shut down 1,740 ft.
Williams and others' No. 1 Poncey, 459 ft. S and 1,062 ft. E Sec. 26, Blk. 214, T.&St.L.R.R. Co.	Shut down 515 ft.
COKE COUNTY	
Cates & Dennis' No. 1 Mimms, 2,500 ft. S and 330 ft. E of NW cor. Sec. 47, Blk. 4, T.&P. Sur.	Show oil 1,580 ft.; shut down 1,655 ft.
Cates & Dennis' No. 2 Mimms, 2,340 ft. N and W SE cor. Sec. 8, Blk. W, T.&P. Sur.	Spudded and shut down.
Lipan Oil Co.'s No. 1 E. C. Rawlings, Sec. 390, Blk. 1-A, H.&T.C. Sur., elev. 2,750 ft.	Shut down 2,860 ft.
Mid-Kansas Oil Co.'s No. 1 W. E. Lackey, 330 ft. N and E of SW cor. Sec. 272, Blk. 1-A, H.&T.C.	Pay 3,755-56 ft.; 6⅝-in. casing set 3,451 ft.; swabbed 70 bbls. 5 hrs.; filled up 200 ft. in 1 hour and swabbed 8 bbls.; to drill deeper.

(Continued on Page 146)

The present refinery situation is the best salesman the Dubbs Cracking Process has ever had No amount of argument on our part can be half so convincing as the sight, at this time, of fortunate Dubbs Licensees cracking their fuel oil or gas oil and obtaining, by the Dubbs non-residuum method, matchless yields of premium anti-knock gasoline

Universal Oil Products Co
Chicago, Illinois

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Drilling Around Simms Well Expected

Pottawatomie County Wildcat Producer Is Surrounded by Short-Term Leases Held by Competing Companies. Production Holds Up

By W. A. Spinney
Staff Correspondent, Oklahoma Fields

The Simms Oil Co.'s No. 1 Lester, SE cor. NE NE, Section 19-6-4e, in southern Pottawatomie County, continued to hold the leading place among interesting wells in Oklahoma the past week. Leases surrounding this wildcat are held by competing companies and virtually all of them are of the short-term variety, which ordinarily would expire within a few months in the absence of development. This circumstance is expected to result in a stampede to drill up the leases, now that the discovery well is making better than 2,000 bbls. of oil daily.

McGraw Oil Co. and Irwin & Martin and others in their No. 1 in the SE cor. NE NE, Section 2-7-4, had 3 feet of Misner sand at 3,747-50 feet. The top of the Hunton was at 3,750 feet, and at 25 feet in that formation the well made 1,500,000 feet of gas and 730 bbls. of oil in 15 hours. It is still drilling deeper. The well is 1½ miles from production on the north side of the St. Louis Field. It is reported to be running high on the structure and should it make a paying well will cause new wells to be started and mark an extension on the north to the St. Louis Pool.

An opinion expressed generally among geologists is that the Simms well, which is just east of the town of Asher and 5 miles south of production in the Pearson Switch Pool, is producing from the Viola lime. If it is in the Simpson at its present depth of 3,699 feet it means that this formation is much shallower than it is in the Seminole area and that wells can be completed in much shorter time. Many new rigs are expected to go up around the Simms well and in about 60 days more will be known about the possibilities of the supposed pool.

Slick Reported Buying Acreage

T. B. Slick is reported to have been buying acreage near the new Simms well. He already owns a half interest in 80 acres offsetting the well to the south. The other half interest is owned by the Prairie Oil & Gas Co. It is also reported that Mr. Slick has purchased the holdings of the Mardor Oil Co. of Oklahoma City, which consists of the east offset to the Simms well or the west 30 acres of the NW cor. NW, Section 20-6-4, and the SE cor. SW, Section 17-6-4, and that he is negotiating with the Wrightsman Petroleum Co. of Tulsa, for its holdings in the SW NW and N half SW of Section 20-6-4. The Independent Oil & Gas Co. has bought the east 10 acres of the NW cor. NW of Section 20-6-4, from the Mardor Oil Co.

The production of the Simms well for the first eight days after it was drilled follows:

	Bbls.		Bbls.
April 14	500	April 18	2,040
April 15	1,454	April 19	2,127
April 16	2,025	April 20	2,220
April 17	2,020	April 21	2,702

Some Express Doubt

The daily gauge thus shows that the well not only has been holding its production, but gaining slightly. Some oil men, while freely granting that this big yield makes the Simms well extremely interesting, nevertheless incline to the belief that it does not clearly indicate the presence of a new pool of importance. Their view, they say, is based on the supposition that the well is producing from the Viola lime. They point out that other Viola lime wells in nearby areas declined rapidly.

The rest of the State was rather quiet in the matter of field completions. There were 58 wells completed in Oklahoma last week. Of these, 28 were oil wells and 26 dry holes. The four others were gas wells. The oil wells had a total production of 8,221 bbls. Last week there were 77 wells completed in the State. Pottawatomie County led with 11 new oil wells and 4 dry holes. Seminole County had the biggest wells.

The daily average production in the Seminole district for the past week was 375,000 bbls. The daily average pipe line runs from the same district were 375,600 bbls.

The Oklahoma City Pool was inactive. Several wells have taken cores, but they failed to find showings of oil or gas. The discovery well, Indian Territory Illuminating Oil Co.'s No. 1 fee, C SE SE Section 24-11-3n, made 3,303 bbls. of oil April 19 and 333 bbls. of water. It is holding about the same production daily with a slight decline from the preceding week.

Wirt Franklin Petroleum Co.'s No. 1 Lowery, NW cor. SW NW, Section 12-11-3w, is completed for 40,000,000 feet of gas from sand 3,977 to 4,010 feet.

Wells Started Again

Wells that had been shut down in the district are getting started. Indian Territory Illuminating Oil Co. and others' No. 1 Trosper Park, in the C SE NW, Section 13-11-3w, had a good showing of oil and gas at 4,979 feet. The company was using a tester. The same company's No. 2 Bodine, in the SW cor. NE SE, Section 24-11-3w, landed 9-inch casing at 5,214 feet and shut down for cement to set. The same company's No. 1 Hemming, in the NE cor. SW SE, Section 24-11-3w, cemented casing at 5,257 feet and is drilling deeper.

Mid-Kansas Oil & Gas Co.'s No. 2 Fortson, in the C NW NE, Section 24-11-3w, is back on rotary tools and drilling ahead after testing the sand at 5,010 feet and finding water. Sinclair Oil & Gas Co.'s No. 1 Stamper, in the NE cor. SE NW, Section 30-11-2w, cemented the 9-inch casing at 5,250 feet and is drilling deeper. This makes the fourth well to be put back to drilling after being shut down when the shallow sands failed to reveal pay.

Several wells are taking core tests. Some are passing up small showings of oil and gas to drill deeper. The Indian Territory Illuminating Oil Co.'s No. 1 Buttom, SW cor. SW, Section 19-11-2w, took a core of the formation at 5,160-67 feet, found a small show of oil and gas and is drilling at 5,170 feet. Coline Oil Co.'s No. 2 Baldwin, C NW NW, Section 24-11-3w, cored sand at 4,823-42 feet and at 4,842-52 feet and found both of these horizons dry. The company was preparing to take another test at the latter level. Wirt Franklin and others' No. 1 Lord, in the NE cor. NW, Section 25-11-3w, after coring the sand at 4,945-51 feet, landed casing to make a further test.

Beebe Pool Extended

In the Beebe Pool, the American Refining Co. has extended production over a mile north and west in its No. 1 Robertson, NW cor. NE SW, Section 19-5-5e. It was drilling at 2,465 feet and the well swabbed 175 bbls. in 12 hours. The well is producing from the Viola lime, topped at 2,303 feet.

Okfuskee County is coming to life again with good producers. The Prairie Oil & Gas Co.'s No. 1 Simmer, NE cor. SE SW, Section 29-12-10, has the Quinn-Lyons sand at 3,320-22 feet. The first 24 hours' production was 980 bbls., making it the largest producer completed in the Cary Pool to date. C. L. McMahon and others' No. 3 Fixico, SE cor. NW SE, Section 29-12-10, had the Gilcrease sand at 2,948-61 feet. The well made 900 bbls.

(Continued on Page 92)

WILDCAT OPERATIONS IN OKLAHOMA

NORTHERN OKLAHOMA

ALFALFA COUNTY

Company, farm and location—	Remarks:
Smith Bros.' No. 1 Forbes, SE cor. NW NW Sec. 12-27-11w	Drlg. 75 ft.
Washoma Oil Co.'s No. 1 Acre, SW cor. NE, Sec. 14-24-11w	Rig.

BECKHAM COUNTY

C. & H. Petroleum Co.'s No. 1 Barnes, SW cor. NW NE Sec. 32-9-22w	Shut down 3,460 ft.
L. C. Hivick's No. 1 Davis, C NW NE Sec. 4-11-25w	Shut down 725 ft.
Producers Exploration Co.'s No. 1 Seidell, SE cor. SW SW Sec. 17-9-22w	Shut down 2,402 ft.
Trees Oil Co.'s No. 1 Rodgers, SW cor. SW Sec. 30-8-25w	Shut down 430 ft.
Carson and others' No. 1 Danby, SW cor. SE NE Sec. 20-8-22w	Drlg. 1,875 ft.
Pferffel and others' No. 1-A Carter, NE cor. NE Sec. 35-9-22w	Shut down 1,500 ft.
Day Oil Co.'s No. 1 Ault, NW cor. NW Sec. 33-8-21w	Shut down 1,515 ft.
Continental Oil Co.'s No. 1 Proctor, SE NE NE, Sec. 5-8-8e	Rig.

BLAINE COUNTY

Lowen and others' No. 1 Unknown, NW cor. SW NW Sec. 27-16-11w	Spudded and shut down; renewing leases.
Washoma Oil Co. and others' No. 1 Phillips, C NW SW Sec. 13-19-10w	Spudding.

CADDO COUNTY

J. B. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w	Shut down 150 ft.
W. J. Hartley's No. 1 Galbreath, SE cor. NW SE Sec. 29-5-12w	Shut down 3,394 ft.

CLEVELAND COUNTY

Daniels & LeWright's No. 1 Vandever, C SW Sec. 15-7-1w	Shut down 3,130 ft.
Phillips Pet. and T. B. Slick's No. 1 Hentleman, NE cor. NE Sec. 8-10-2w	Fighting cave 5,563 ft.

COAL COUNTY

Indian Territory Illuminating Oil Co.'s No. 1 Harris, SE NE Sec. 10-1-11e	Shut down 1,975 ft.
W. E. McGraw's No. 1 King, C SW NE Sec. 11-1-8e	Rig.
Indian Territory Illuminating Oil Co.'s No. 1 Cook, SW cor. NW Sec. 10-1-11	Drlg. 6,950 ft.
Robert Galbreath and others' No. 1 Jones, SW cor. SE Sec. 24-1-9	Fishing 3,350 ft.
J. S. Cosden's No. 1 Richardson, NW cor. NE NE Sec. 6-2-8	Run. 12-inch casing 1,460 ft.
McGinley & Sigler's No. 1 Willsey, NW cor. SE SE Sec. 7-2-8	Location.
E. W. Whitney's No. 1 Brown, C SE NE Sec. 10-2-8	Rig.

COMANCHE COUNTY

Green and others' No. 1 Wilson, C NE SW Sec. 14-1-12w	Shut down 4,055 ft.

CUSTER COUNTY

W. E. Witt's No. 1 Wellman, C SE Sec. 1-14-14w	Rig and tools.

DEWEY COUNTY

Huckaby & McCoy's No. 1 Perfect, NE cor. NE Sec. 9-18-15w	Shut down 4,500 ft.

GARFIELD COUNTY

E. L. Love and others' No. 1 White, SE cor. NW Sec. 9-24-6w	Shut down 4,755 ft.

GRADY COUNTY

J. V. Bailey's No. 1 Hubbard, C NE NW Sec. 1-10-6w	Spudded and shut down.
J. M. Henry and others' No. 1 Abraham, SE cor. NW Sec. 4-5-8w	Rig.
Wolfe et al's No. 1 Unknown, NW SE Sec. 15-13-18e	Rig on ground.

GRANT COUNTY

Cowden and others' No. 2 Vollmer, CEL NE SW Sec. 22-25-4w	Shut down 5,640 ft.
Larlo-Lathrop's No. 1 Cornell, NW cor. NW Sec. 24-28-2w	Shut down 3,960 ft.

GARVIN COUNTY

Gilcrease Oil Co.'s No. 1 Kelly, SE cor. NW NE Sec. 36-3-3w	Drlg. 2,300 ft.
Bison Oil Co.'s No. 1 Labor, NW cor. Sec. 17-1-3e	Underreaming 8-in. csg. 2,100 ft.

GREER COUNTY

S. M. Stauffer's No. 1 Castleman, SW NE Sec. 8-4-20w	Rig.

HARMON COUNTY

I. T. I. O. Co.'s No. 1 fee, C SW SE Sec. 17-5-24w	Rig.

HARPER COUNTY

Hoffer Oil Co.'s No. 1 Cooper, NW cor. SE SE Sec. 12-25-22w	Shut down 4,130 ft.

(Continued on Page 156)

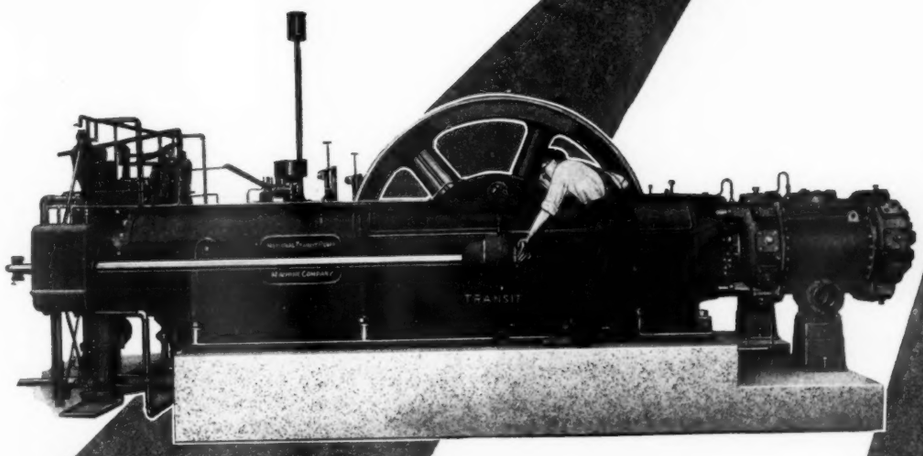
MID-CONTINENT WELLS STIR UNUSUAL INTEREST

Five Mid-Continent wildcats, each indicating the possibility of a new pool, are directing unusual attention to these areas in view of the fact that any important additions to the total ouput of petroleum at this juncture would have a disquieting effect on plans looking to a check on overproduction. New drilling is expected to reveal more fully within the next 60 to 90 days the significance of these strikes. The new wells are producing high-gravity crude ranging from 36 to 44 degrees.

The wildcat discoveries are widely scattered over the Mid-Continent Field. One is the Simms Oil Co.'s well in southern Pottawatomie County, Oklahoma. Another is the Gypsy Oil Co.'s well 300 feet north of the Oklahoma state line in Sumner County, Kansas. Others are the Shell Petroleum Corp.-Dickey Oil Co. well 6 miles south of Wichita, Kans.; the Shell Petroleum Corp.'s Lygrisse well 8 miles northeast of Wichita, and the Phillips Petroleum Co.'s second well on its block in Ellis County, Kansas.

All the wells look good at this time and may develop into big additions to the producing column. They are expected to start drilling activity in surrounding areas.

STRONG AS THE HILLS
Quiet as the Valleys



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OIL CITY, PENN'A.

New Wells Keep Kansas in Limelight

Producers Brought in by Shell and Phillips May Prove To Be Pool Openers. State Undergoes Lively Leasing Campaign

By W. A. Spinney
Staff Correspondent, Kansas Fields

Kansas remained in the limelight the last week with three new wildcat wells that bear marks of being pool openers, making a total of five productive wildcat wells in the last two weeks. This, however, was to be expected, as the State has been through one of the most active leasing campaigns in recent oil history, and the larger oil companies are still taking blocks of leases in the western part of the State. The Shell Petroleum Corp. completed two of the wildcats and the Phillips Petroleum Co. the third.

The Shell Petroleum Corp.'s No. 1 Haury, NE cor. SW SE, Section 11-23-2w, Harvey County, blew in with an initial production of 175 bbls. at a total depth of 3,045 feet. The well originally had been completed as a gas well and was making 20,000,000 feet of gas. The company considered it a good looking oil prospect and deepened it. The company now has what seems to be a profitable oil deposit in the center of a large block of leases.

Another wildcat discovery well was the Shell Petroleum Corp.'s No. 1 Lygrisse in the SW cor. NE, Section 15-26-2e, Sedgwick County. The well is 8 miles northeast of Wichita and is also situated in a large block of leases controlled by the company. The Gypsy Oil Co. has the east and southeast offsets. The top of the lime pay was 3,164-66 feet and the well is estimated good for 1,000 bbls. The well filled to the top with oil 30 minutes after the pay horizon had been penetrated.

Phillips Well Good for 200 Bbls.

The Phillips Petroleum Co.'s wildcat, No. 1 Legleeter, NE cor. NW SE, Section 10-16-18w, Rush County, showed for 4,000,000 feet of gas in the Gorham pay last week. It was cleaning out, and fishing for tools at a total depth of 3,570 feet. The well was put to swabbing and made 82 bbls. in 15 hours one day last week and it is estimated to be good for 200 bbls. when completed. Arrangements are being made for a pipe line or a loading rack to care for the crude from this well and another which the company completed last fall about 3 miles north, on the same block.

The Shell Petroleum Corp. completed a well a week earlier, 6 miles south of Wichita, its No. 1 Robbins, in the NW cor. SW, Section 21-28-1e, Sedgwick County. The initial production was 320 bbls. from the pay sand at 3,080-87 feet and later the well made 1,071 bbls. in four days. This well is the third test that the company has drilled on the same block. The two others were failures and were abandoned. The first test was drilled east of the river in the NW cor. NE NW, Section 26-28-1e, and it was abandoned at 3,802 feet. The second test was drilled in the SE cor. NE NE, Section 28-28-1e, and it also was abandoned at 3,105 feet.

The Gypsy Oil Co.'s wildcat well in Sumner County, 300 feet north of the Oklahoma state line, also drilled in a week earlier, established itself as a real wildcat well when it was opened wide at the control head one day last week and produced 105 bbls. of oil in 15 minutes. The company has the well pinched in to about 400 bbls. a day, awaiting pipe line connections.

Considered Important

The well is considered by many to be one of the important oil strikes in the past 10 years in Kansas. The Wilcox sand in the well was found at 4,768-82 feet and it made an initial production of 60 bbls. an hour until it was pinched in.

Marland Production Co. in the pool which it opened up a short time ago, 3 miles northeast of the Valley Center Pool, is bringing in another well, its No. 1 Westerfield, NW cor. SE SW, Section 16-25-1e. The top of the Simpson was found at 3,326 feet. The first oil was at 3,330-38 feet, where it swabbed 60 bbls. in two hours. A later production test was made and the well gauged 248 bbls. in 15 hours.

This well offsets the discovery well, the same company's No. 1 Goodrich, which found production in the chat at better than 2,900 feet with an initial production of 3,000 bbls. While the new well had water in the chat at the same level, it opens up new possibilities in the deeper horizon. This well will have an important bearing on potential production, as the pool will have two pay sands to drill for. The same company's No. 2 Goodrich, in the NW cor. NE SW, Section 16-25-1e, topped the chat at 3,004 feet. The pay was at 3,023-36 feet, with an initial production of 520 bbls.

It is reported that the well Wakefield and others are drilling in the NW cor. NE, Section 18-30-5e, Cowley County, has the top of the Bartlesville sand at 2,850 feet to 2,900 feet. It is estimated that the well will make 100 bbls. a day. The well is a semiwildcat and a later report is awaited with interest.

Production in State Increases

The production in the Sedgwick County pools is holding about the same as the preceding week, but the entire State will show an increase and will put the figures over the 100,000-bbl. mark again. Last week was the first time the State's production has been this high for several years.

The gauges of all completed wells in the Sedgwick County Pool as of April 1 follow:

Company, farm	Location	Well No.	Prod.
Allison:			
Kelly	6-26-1e	1	
Barnsdall:			
Samuel	24-25-1e	1	
Bu-Vi-Bar et al:			
Wright	12-26-1w	1	1,1
Wright	12-26-1w	2	1,1
Lyons	7-26-1e	1-2	1,1
Lyons	7-26-1e	3	1,4
Lantz	12-26-1w	1	6
Branch	6-26-1e	1-2	1,3
Bright "A"	6-26-1e	1	1
Bright "B"	6-26-1e	1	1,0
Byers	7-26-1e	1	2
Emrich	6-26-1e	1	3
Goodrich	6-26-1e	1-2	7
Shawver	7-26-1e	1	1,0
Shawver	7-26-1e	2	1,3
Davis & Shell:			
Wilson	12-26-1w	1-2-3-5	1,1
Derby Oil Co.:			
Gorman	6-26-1e	1	9
Marland:			
Goodrich	16-25-1	1	1,9
Mary Jane:			
Fitch	6-26-1e	1-2	1,4
Montour Oil Co.:			
Lavender	6-26-1e	1	1,0
Phillips:			
Dufford	1-26-1w	1-2-3	3
Piefer	6-26-1e	1	2
Prairie:			
Cross	27-25-1w	1	
Smyser	36-25-1w	1-2	2
Pyle-Sutter:			
Caldwell	6-26-1e	1	6
Caldwell	6-26-1e	2	1,0
Reynolds-Hays:			
Roll	7-26-1e	1	3
Stearns-Streeter:			
Roll	7-26-1e	1	6
Tidal Oil Co.:			
Scherger	6-26-1e	1	1
Vickers:			
Nesser	6-26-1e	1-2	1,4
White Eagle:			
Baylor	6-26-1e	1	1
Total		42	25,2

Ted Washabaugh and others' well in the southern part of McPherson County, which is in the trend north of the big play in Harvey and Sedgwick Counties, is still attracting attention to the possibility of a pool in this county. Their No. 1 Vashell in the NE cor., Section 9-21-3 has a pay sand 3,301-04 feet and it is making 3 bbls. an hour.

Barber County

Barber Oil Co.'s No. 1 Blunk, C NW NW, Section 20-34-13w, is dry and abandoned at 5,395 feet.

Butler County

Lario Oil & Gas Co.'s No. 1 Glanc SW cor. Section 10-26-3e, is rigging up. Aladdin Petroleum Corp.'s No. 1 McLean SW cor. SE NW, Section 8-27-6e, is drilling at 900 feet. Patten and others No. 1 Marshall, NW cor. SE SW, Section 11-27-5, is making 53 bbls. from sand at 2,690-2,719 feet. Martle Oil & Gas Co.'s No. 1 Morgan, SE cor. SW Section 12-27-5, is dry and abandoned at 3,156 feet. Empire Oil & Refining Co. No. 7 Sherrock, SE cor. NE SW, Section 27-27-5, has been completed for 20 bbls. in sand at 2,712-52 feet.

Coffey County

Spencer and Derby Oil Co.'s No. 1 Crandall, NW cor. SW, Section 14-23-1 is a dry hole at 1,555 feet.

Cowley County

Broadwater Drilling Co.'s No. 1 Plummer, SE cor. NE SE, Section 17-30-3 is dry and abandoned at 3,490 feet. White Eagle Oil & Refining Co. and others' No. 1 Franks, NW cor. SE, Section 25-31-4

(Continued on Page 91)

WILDCAT OPERATIONS IN KANSAS

BARBER COUNTY

Company, farm and location—	Remarks:
Allison & Fitzwilliams' No. 1 Morrisse, C NW SE SE Sec. 9-30-12w	Drlg. 1,450 ft.
Barbara Oil Co.'s No. 1 Lytle, CNL NE NE SW, Sec. 12-33-13w	T.D. 4,651 ft.; P.B. to 4,558-68 ft.; 25,000,000 ft. gas.
Rolland et al's No. 1 Pickens, NE cor. NW NE Sec. 27-30-14w	Casing 8-in. 4,475 ft.

BARTON COUNTY

Everett & Wiley's No. 1 Ward, NW cor. SW Sec. 12-20-13w	Shut down 3,943 ft.
Phillips and Shell's No. 1 McClellan, SE cor. SW Sec. 23-26-6e	Drlg. 1,930 ft.

BUTLER COUNTY

Aladdin Petroleum Co.'s No. 1 Bronsenger, NE cor. NE SW Sec. 24-27-3	Rigging up.
Shell Petroleum Corp.'s No. 1 Thiesstin, C SE SW SE Sec. 10-24-3	Drlg. 1,235 ft.
Smith & Ash's No. 1 Donnelly, NE cor. NE Sec. 8-24-6	Drlg. 1,500 ft.

CHASE COUNTY

Greiner & Fowler's No. 1 Carson, NE cor. NE Sec. 9-21-7	Shut down 3,190 ft.
Marland Prod. Co.'s No. 1 fee, SW NE Sec. 8-31-8e	Drlg. 250 ft.

CLAY COUNTY

Gray et al's No. 1 Smith, NE SE Sec. 30-6-3e	Rig.

COWLEY COUNTY

Cameron et al's No. 1 Zirkle, Sec. 35-31-3e	Fishing 3,165 ft.
Pyle & Sutter's No. 1 Lindstrom, SW cor. NE Sec. 9-35-4	Shut down 3,648-51 ft.; hole full water.
J. B. Markey's No. 1 Tatum, SE cor. SW Sec. 11-31-6	Shut down 520 ft.
Wakefield & Osborne's No. 1 Osborne, NW cor. NE Sec. 18-30-5	Drlg. 2,450 ft.

ELLIS COUNTY

James Brouk's No. 1 Wagner, C SE SE Sec. 35-15-16w	Drlg. 3,385 ft.
T. C. Johnson's No. 1 Robbins, SW NW Sec. 15-14-16w	Drlg. 1,040 ft.
John Brown's No. 1 Gestner, SE cor. SW NE Sec. 13-13-18w	Drlg. 1,350 ft.
Rush Oil Co.'s No. 1 Gatewood, NW cor. NW Sec. 4-15-20w	Shut down 1,100 ft.
Finney & Weiner's No. 1 Freeman, SE cor. SW Sec. 24-15-20w	Spudded and shut down.
Atlantic Oil Prod. Co.-D. B. Mason's No. 1 Gorham estate, C SE SE Sec. 35-15-16w	Shut down 3,175 ft.
Phillips Pet. Co.'s No. 1 Johnson, SW cor. NE Sec. 9-13-19w	Drlg. 2,680 ft.
Phillips Pet. Co.'s No. 1 Dechant, NE SE Sec. 12-13-16w	Drlg. 1,990 ft.
Phillips Pet. Co.'s No. 1 Schneider, NW cor. Sec. 20-12-17w	Drlg. 3,140 ft.
Burger et al's No. 1 Hadley, SW cor. SW NW Sec. 20-11-17w	Spudding, shut down.
John Brown No. 1 Company's No. 1 Gestner, SE cor. SW NE Sec. 13-13-18w	Drlg. 1,350 ft.

EDWARDS COUNTY

Amerada & Wilcox's No. 1 Teansil, C NW NW Sec. 32-25-19w	Drlg. 4,925 ft.
British American Oil Co.'s No. 1 McCarty, NE cor. NW Sec. 31-25-17w	Shut down 4,160 ft.

GEARY COUNTY

Wright et al's No. 1 Younker, NW cor. NE Sec. 17-11-5	Drlg. 1,560 ft.

GRAHAM COUNTY

Gulf Coast Oil Co.'s No. 1 Johnson, C S half Sec. 27-8-25w	Shut down 2,450 ft.

GREENOOD COUNTY

P. H. Ballieu's No. 1 Bright, NE cor. SW Sec. 22-27-12e	Shut down 1,210 ft.

HARPER COUNTY

Amerada Pet. Corp.'s No. 1 Mendiville, C E SE Sec. 24-34-6w	Old total depth 5,360 ft.; plugged back to 4,000 ft.; drlg 4,785 ft.
Independent & Reserve Oil Co.'s No. 1 Moulds, C NE Sec. 7-24-1w	Rig.

HARVEY COUNTY

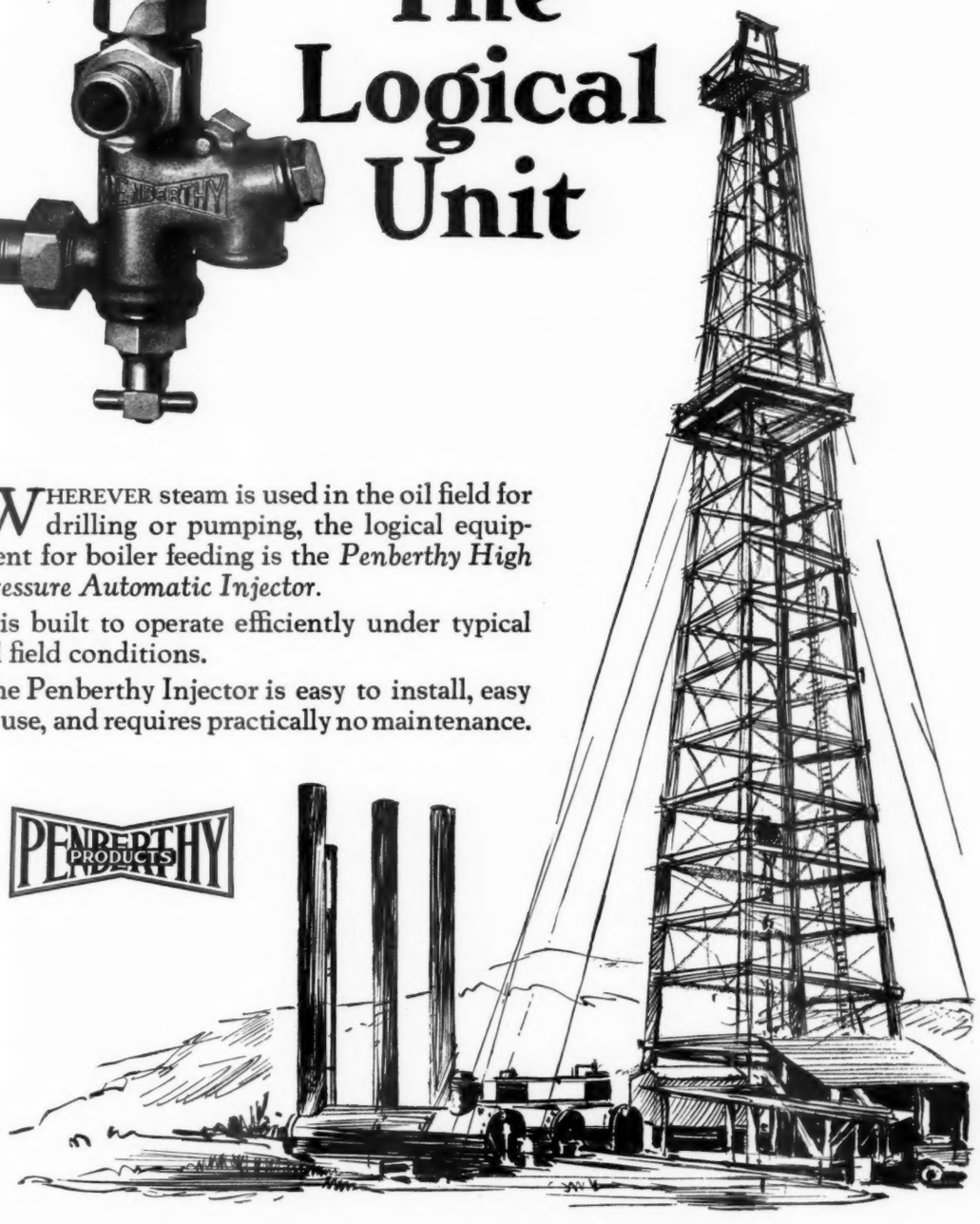
Roth & Parrent's No. 1 Brombrowsky, NW cor. Sec. 26-22-1e	Drlg. 700 ft.
R. F. Garland's No. 1 Cox, NE cor. NE Sec. 27-24-1w	Hole full water; abandoned 3,517-28 ft.
Empire G. & F. Co.'s No. 1 Tangeman, SW cor. NE NE Sec. 19-22-1e	Drlg. 3,250 ft.
Mrs. Gay et al's No. 1 Grove, C NW NE NW Sec. 29-23-1w	Shut down 2,100 ft.
Slick & Corinell's No. 1 Gatz, NW cor. SE Sec. 36-22-16	Drlg. 440 ft.
Hartman & Skaer's No. 1 Seaman, NW cor. NE SE Sec. 26-24-1e	Drlg. 2,545 ft.
Helmerich & Payne's No. 1 Lindamond, C SW NE SW Sec. 2-22-1e	Drlg. 3,070 ft.
Fisher & Louch et al's No. 1 Reiger, NW cor. NE Sec. 17-23-2	Drlg. 2,980 ft.
Jolly & Ogg's No. 1 Randall, NE cor. NE Sec. 11-24-1w	Drlg. 2,945 ft.
Patton et al's No. 1 Duning, SE cor. SW NE Sec. 26-24-1	Shut down 1,250 ft.
Rosenthal et al's No. 1 Ingalls, C NW SW Sec. 24-23-3w	Drlg. 1,405 ft.
Jolly & Ogg's No. 1 Hupp, SE cor. NE Sec. 22-23-1w	Fishing 1,395 ft.

JEFFERSON COUNTY

Wichita Oil Co.'s No. 1 Simpson, NW cor. SW SW Sec. 19-10-17	Rigged up and shut down.

(Continued on Page 156)

The Logical Unit



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Champagnolle and Shongaloo Active

Larger Producer Than in Eastern Extension Well Feature in Arkansas. Forty-Barrel Pumper in Gas Area

By D. H. Bancroft
Staff Correspondent, Louisiana-Arkansas

SHREVEPORT, La., Apr. 22.—Champagnolle in Union County, Arkansas, and the Shongaloo district of Webster Parish in Louisiana shared the honors in proven territory in this division this week, the former with a larger but not necessarily better producer than the latest sensation in the eastern extension and the latter with a 40 bbl. pumper in what has heretofore been mostly gas territory. Ohio Oil Co.'s No. 1 Oliver in Section 7-17-13, Union County, started off with 3,000 bbls. fluid 40 per cent water through a 1½-inch choke from 6 feet of sand, total depth 3,048 feet. The discovery extension well in Section 12-17-14 made an initial 2,500 bbls. fluid, 20 per cent water, through a seven-sixteenths inch choke, 4 feet of sand, total depth 3,037 feet, and the first offset, Arkansas Natural Gas Co. No. 1 Morris, Section 7-17-13, did 1,122 bbls. net oil from fluid, 80 per cent water, from 7 feet of sand, total depth 3,037 feet. The present well is a south offset to the Arkansas well and approximately 300 feet southeast of the well in Section 12-17-14. Ohio's No. 1 B. H. Raulston, south of the extension and offsetting No. 1 Oliver on the west, will be a completion this coming week, having 6⅝-inch set at 3,013 feet, total depth 3,017 feet. The Webster Parish well was J. W. Clark's No. 2 Mayfield, Section 20-23-9, pumping 40 bbls., total depth 2,771 feet. No. 1 on the same lease went to salt water after showing for a like sized well at about the same depth. It was drilled by interests who previously had completed a 40 to 50 bbl. producer in that immediate vicinity.

Louisiana Gas Merger

Louisiana Gas & Fuel Co. has acquired natural gas interests in Louisiana of Electric Power & Light Corp. and all the common stock of The Palmer Corp. of Louisiana. The company controls substantial natural gas producing properties in the Monroe, Richland, Shreveport and other fields in Louisiana.

The natural gas interests acquired include Industrial Gas Co., Southern Gas & Fuel Co., Northern Louisiana Natural Gas Co., Ouachita Natural Gas Co., Inc., and the companies formerly subsidiary to Gas & By-Products Co. The Palmer Corp., which is now a subsidiary of Louisiana Gas & Fuel Co., was one of the first and is among the large natural gas operating companies in Louisiana.

H. C. Couch, of Pine Bluff, Ark., is chairman of the board of the new company, and N. C. McGowen, of Shreveport, La., is president.

Gas Developments

Gas developments, in completions, pipe line and drilling activities, assumed a stronger position, mainly through announcement of placing orders for pipe for the Monroe—St. Louis line. These orders amount to approximately 115,000 tons of pipe for 554 miles of line. There will be 8 river crossings of multiple 10-inch lines and the estimated cost is $16,500 per mile.

It is also reported that the Southern Natural Gas Corp.'s Monroe-Birmingham--Chattanooga-Atlanta 22-inch line is moving rapidly toward construction activities. Right of way for the St. Louis line has been purchased and much progress made on this phase of the Birmingham undertaking. Some of the right of way has been surveyed and bought and airplanes are reported employed in reconnaissance work across Mississippi and Alabama. The main line on this project will start at Pioneer, West Carroll Parish, where feeders from the Richland and Monroe districts will converge, and cross the Mississippi about 30 miles north of Vicksburg. Contract for the St. Louis line is reported awarded to Ford, Bacon & Davis for $26,000,000 and the Birmingham project to Natural Gas Engineering Co., of Monroe. With respect to the latter, however, it is also understood that Natural Gas Engineering Co. has been retained only for the engineering phases of the work and that contracts for actual construction have not been awarded. In view of the aerial surveys referred to and not all the right of way having been obtained, it seems reasonable that the latter situation is more accurately reported.

In preparation for the increased demand for gas occasioned by these two projects, which are scheduled for completion by January 1, 1930, and also to take care of current demand from carbon plants and the seven other lines already pulling on the northeastern gas reserves, the Monroe and Richland districts are in for a protracted period of intense development, evidences of which have already appeared and are emphasized by the permits for new work and the "mine run" of completions. Of the latter there have been 20 since the first week of March which developed a total initial open flow of 282,750,000 feet of gas of which between 200,000,000 and 250,000,000 feet, on a liberal estimate, is available under Conservation Department rulings.

Gas Completions

Four gas wells were completed in the Shreveport division this week, two in Morehouse Parish and two in Panola County, Texas, in addition to the one in the Benson district of DeSoto Parish. Interstate Natural Gas Co., which made locations for four more wells in the Monroe district, completed No. 2 Crowder-Moore, Section 31-21-5, Morehouse Parish, gauging 3,000,000 feet, and Southern Carbon Co. completed No. 2 Miles, Section 1-20-4, Morehouse Parish, with 1,000,000 feet. In Panola County H. H. Alvord's No. 1 Floyd, B. C. Jordan Survey, had 4,000,000 feet initial and The Texas Company's No. 9-A T. C. Adams, Thomas Cox Survey, gauged 1,750,000 feet, total depth 973 feet. Natural Gas Producing Co. abandoned location for No. 3 Thomas Moore, B. C. Jordan Survey, and United Carbon Co. abandoned No. 1 Abe Arent, Section 14-19-3, Ouachita Parish, on account of defective location.

Dixie Oil Co.'s No. 92 Dillon, Section 13-21-15, Pine Island district of Caddo Parish, drilling out a bridge, is within 500 feet of total depth, 6,099 feet, where it had a highly encouraging show of very rich gas and is expected to be the headliner next week or the week after and meanwhile the company is arranging to test a shallow well, No. 96 on the same lease, at 1,753 feet.

Arkansas Natural Gas Corp. has begun No. 13 Logan, Section 33-10-12, in the Pleasant Hill district of Sabine Parish, where no new development has taken place in the past few months but which district is holding up well to a daily average, fluctuating within a few barrels of 500 bbls. per day. It is also reported that other unidentified interests are figuring on three more wells in that territory, induced by the steady decline in production in this division against which the few new wells in Champagnolle and Mount Holly districts in Arkansas have not succeeded in making an impression.

Webster Parish Test

There is some speculation as to how much farther Magnolia Petroleum Corp. intends going with No. 1 McCook & Hibbler, Section 22-21-10, Cotton Valley, Webster Parish. A week ago it was shut down for orders at 4,812 feet after getting 115 feet of salt water on drill stem test and was drilling on this week's report at 4,894 feet, somewhat deeper than it should have found the deep gas. Three weeks ago it tested 300,000 feet of gas at 4,761 feet, and at 4,984 feet was in the lime and shell formation like that which produced the deep oil in Pine Island at around 3,800 feet two years ago. However, it may turn out Magnolia is rigging up to deepen No. 3 Ira Cox in Section 23-21-10 for a deep well.

C. H. French's No. 5 Muslow in Section 31-21-15, Caddo Parish, was completed as a 25 bbl. pumper in the shallow Pine Island horizon at 1,695 feet. Arkansas Natural Gas Corp.'s No. 11-B was a salt water hole at 1,549 feet in Section 17-10-2e, Urania district of LaSalle Parish. Trimount Petroleum Co.'s No. 1-A Mebane-Stiles in the N. Gupton Survey of Marion County, Texas, across the state line from the Lewis district of Caddo Parish, was completed pumping an initial 15 bbls. from a total depth of 2,365 feet.

Daily Average Production

The division's daily average runs from the field showed a small increase, 53 bbls. over production last week, shipments being 109,115 bbls. compared to 108,585 the week before. All but 1 bbls. of the increase was from Arkansas and Champagnolle contributed 235 of this, El Dorado leading it by 10 bbls. Smackover heavy oil shipments were 7 bbls. under last week's average. The greatest difference in Louisiana runs was in Caddo heavy, which showed a decline of 105 bbls. against which increases of less than 100 bbls. each in Homer, Urania and Pleasant Hill had little effect, other districts also declining. El Dorado and Champagnolle were the only Arkansas pools showing an increase. Daily average runs from the several pools were:

Louisiana	
Caddo, light	8,12
Caddo, heavy	3,15
Homer	4,00
Haynesville	5,25
DeSoto-Red River	3,95
Elm Grove	6
Bellevue	8
Cotton Valley	3,00
Urania	5,25
Pleasant Hill	4
Sarepta-Cartersville	2
Total	35,63
Arkansas	
El Dorado	4,77
Smackover, light	6,20
Smackover, heavy	48,42
Stephens	1,01
Nevada County	1,21
Lisbon	1,37
Champagnolle	10,40
Bradley	10
Total	73,49
Both states	109,11
Last week	108,58
Increase	5

NORTH LOUISIANA

Bossier Parish

Elm Grove—F. M. Hood, deepening No. 1 Mayer, Section 30-16-11, set 4½-inch at 2,426 feet, total depth 2,43 C. W. Jones' No. 1 Horton, Section 31-16-11, is drilling at 890 feet.

Caddo Parish

Mooringsport—Falcon Oil Co.'s No.

(Continued on Page 122)

TREND OF PRODUCTION DETERMINED IN MOUNT HOLLY DISTRICT, ARKANSAS

By D. H. Bancroft

SHREVEPORT, La., Apr. 22.—Determination of trend of production north or south in the Mount Holly district of Ouachita County, Arkansas, came early, if the opinions of some qualified to speak with authority are correct. It couldn't have gone very far north to begin with, unless experiences in Homer and elsewhere in this division were to be repeated, for the discovery well was recognized to be close to the fault, but failure of the Atlantic Oil Producing Co.—E. M. Jones No. 1 Allen, a north offset to the discovery well in Section 25-15-18, to get production where it was expected limits possibilities still closer to the discovery on that side. A drill stem test at 2,866 feet where the discovery got production was salt water and another from 2,927-68 feet was dry. However, it is understood the hole will be cored to 3,100 feet. Several faults in this territory appear to be indicated for, in a way, the general structural feature appears to be a downthrow to the north with a series of minor faults radiating to the south.

Magnolia Petroleum Co.'s No. 1 Wilson, offsetting McDonald Brothers' No. 1 on the same lease, was dry at 2,750-54 feet and cored sand showing oil from 2,954-59 feet. Root Refineries' No. 1 Wilson, an east offset to the discovery well, C. H. McDonald's No. 1 Wilson, got 100 feet of oil on drill stem test of sand from 2,841-44 feet and has cemented casing for completion. On its last gauge the discovery well pumped 240 bbls. 10 per cent b.s. and McDonald Brothers' No. 1 Wilson pumped 40 bbls., 10 per cent b.s. and water Six miles north of the discovery well Timberlake and others found the Nacatoch at 1,762 feet, and were arranging for drill stem test. Five miles southeast of the discovery Hawthorn Oil Co.'s No. 1 Smith, Section 8-18-17, Union County, is approaching a depth where it should be running testing tools within the next week or so, finding the top of the Nacatoch at 1,860 feet and drilling on last report at 2,610 feet.

Atlantic Oil Producing Co. and Ohio Oil Co. have started work on deepening two old tests, the former on No. 1 Bledsoe, Section 20-15-7, Ashley County, and the latter on No. 2 Southern Lumber Co. Section 19-16-9, Bradley County. J. G. Marcum also is going deeper with No. 1 DeYampert, Section 5-19-4, Ashley County. This last well claimed an oil show at 3,238-41 feet on top of two feet of salt water sand and got salt water again at 3,310 feet and shut down. In Calhoun County, Joe Hurley of El Dorado, W. M. Redditt, and Rice Drilling Co. of Shreveport are planning a 3,300 foot test on a block centering around Section 27-16-13 in which the location probably will be made. Standard Oil Co. of Louisiana, Ohio Oil Co., Phillips, Shell, Magnolia and Amerada companies and Yount, Humble and Pure companies have blocks surrounding them and it is understood the Pure Co. plans a well on its block in the near future. Shows in the Marcum well and streaks of sand showing traces of oil in the Ohio's No. 2 Southern Lumber

(Continued on Page 125)

Complete Biggest Oil Well in Refugio

Offsets Discouragement Over Two Disappointments. No. 10 Rooke Comes in at Rate of 2,000 Bbls. a Day

By B. D. Stevenson
Staff Correspondent, Southwest Texas Fields

SAN ANTONIO, Tex., Apr. 22.—Disappointment registered in the Refugio Field in Refugio County early last week when the Houston Gulf Gas Co.'s (Mission Drilling Co.) No. 3 Rogers failed to make anything but salt water in the 3,700-foot sand and No. 7 Fannie Heard made gas instead of oil though offsetting an oil well, was tempered by rejoicing when the Houston Oil Co.'s No. 10 Rooke in the 3,700-foot sand came in at the rate of 2,000 bbls. a day and, choked to a quarter inch, was flowing at the rate of 500 bbls. of pipe line oil daily. It is the biggest oil well thus far in the field.

No. 3 Rogers is in the northwest edge and it had early indications favorable for an oiler. No. 7 Fannie Heard in the southeast part of the field, a west offset to the Nellie B. Cummins, which came in for 1,000 bbls. of oil a day, and between the Cummins well and the field, was a real disappointment when it came in gas though it was a big one. It was slated to make an oil well.

The Houston Oil Co.'s No. 10 Rooke had been a gas well in shallower sands and was lately deepened. It is 2,000 feet northwest of the discovery 3,700-foot oil well in the south end and widens out the 3,700-foot oil production. It is a little over 7,000 feet west and 1,500 feet south of the Nellie B. Cummins No. 1, which is now pinched to 115 bbls. of oil a day, and the discovery oil well in the south end, No. 1 Claud Heard, drilled by the Texas Gas Co. and sold to Benedum & Trees, is 6,000 feet west of the Nellie B. Cummins No. 1 and about 3,000 feet south. Between these there are some gas wells in shallower sands, No. 7 Fannie Heard being the only gas well at 3,700 feet.

Possible Large Oil Field

There are now eight oil wells in the south end and one in the north end in the same sand and over 3 miles away. It will readily be seen that these oil wells widely scattered may portend a large oil field. The first 3,700-foot oil wells in the south end carries some water but they have been worked over and this has been corrected to some extent. No. 7 Fannie Heard coming in gas was a little discouraging but here is a field about 3½ miles long with one well at the north end while at the south end the wells are scattered to a width of over a mile. Most anything can happen in the territory in between.

Joe Bruner Field

Not a great deal happened in the Joe Bruner Field in Caldwell County last week except that about half of the companies are now paying $1 a barrel for the crude and the rest paying 80 cents. Gulf, Humble and Magnolia pipe lines are paying 80 cents for crude and Sun Oil Co.'s pipe line, Shell Petroleum Co.'s pipe line and Petroleum Pipe Line, which is a subsidiary of Cranfill & Reynolds, are each paying $1 a barrel. Several wells have been completed but the north end of the field, where all the interest is centered, has not materially changed since a week ago.

Laredo District

In the Laredo district Simms Oil Co. has another 35,000,000-foot gas well, No. 4 Dinn, a few miles north of the Cole gas field in Duval County. Simms discovered this gas area with a well drilled about three years ago. It is but recently that development started on the block of leases. No. 4 is in the SE cor. of Survey 666, and a west offset to a gas well drilled by Mackay. There are four gas wells and three belong to Simms. Magnolia Petroleum Co. got 15,000,000 feet of gas in sand at 2,388-97 feet in Survey 694 in the gas area north of the Cole oil pool in Webb County and about 4 miles west of the Simms gas well.

In Survey 74 of Zapata County, where a new oil field is struggling into existence T. P. Morgan completed his No. 1 Hinnant a 50-bbl. producer in sand at 1,612--14 feet. This is the third well in that sand, the three wells being about a mile north of a group of about 10 wells drilled by O. W. Killam and completed in sand at about 1,465 feet.

Kingsville Field

Humble Oil & Refining Co. is to make a test of its No. 4 Flato in the Kingsville Field at a little below 5,600 feet. It had quite a showing of oil on the ditch and when a drill stem test was made showed a little oil but enough to warrant setting casing.

Carolina-Texas

R. O. Barnsley has about 4,000 bbls. of oil in storage from his No. 1 Webster in the south part of the Carolina-Texas Field in Webb County, and the well is shut in for want of pipe line connections. The oil is high gravity coming from about 2,600 feet and the well was making about 100 bbls. a day till shut in. Two other wells in that area bring the total potential to about 200 bbls. and with pipe line connections and the drilling of seemingly proven locations the production could readily be run up to important proportions. First oil in this area a quarter mile north was discovered by Usher Carson and the Associated Oil Co. a couple of years ago but dry holes and gassers around the discovery well dampened the enthusiasm. Now a pool seems likely a little to the south. W. R. Shankle's No. 1 Webster, 1,600 feet farther southwest, failed to pick up the 1,600-foot sand and at 3,045 feet has a fishing job but looks like a dry hole. Trap Shooter Reilly, a little less than a half mile south of the Barnsley's No. 1 Webster, is starting No. 1 Benavides near the center of the north line of Survey 685 and has the derrick up and R. O. Barnsley has gone a half mile north and is starting No. 1 fee and is down 100 feet and the Texas Company a half mile west got a sand at 2,115-21 feet in its No. 2 Benavides in Survey 683 but is deepening and now at 2,265 feet.

COMPLETIONS

Bee County

Mission Drilling Co.'s No. 1 Ray, in Pettus gas field, completed between 2,800 and 2,900 feet gas well, good pressure but no volume.

Bexar County

W. H. Kennon's No. 1 fee, Survey 4, plugged back from 1,145 feet to 730 feet and completed gas well.

Caldwell County

Shell Petroleum Corp.'s No. 2 F. Tiller, Gerren Hinds Survey, completed 55 feet, abandoned.

Shell Petroleum Corp.'s No. 8 F. Tiller, Gerren Hinds Survey, completed 2,695 feet, pumping 932 bbls.

Shell Petroleum Corp.'s No. 1 W. L. Smith, A. Floyd Survey, completed 2,699 feet, flowing 574 bbls.

Shell Petroleum Corp.'s No. 1 New, James Hinds Survey, completed 2,739 feet, pumping 90 bbls.

Shell Petroleum Corp.'s No. 6 Cora Malone, A. Floyd Survey, completed 2,699 feet for 350 bbls. on pump.

Humble Oil & Refining Co.'s No. 1-C J. R. Tiller, completed 2,696 feet, swabbing 10 bbls. an hour.

Humble Oil & Refining Co.'s No. 3 L. G. Hanson, James Hinds Survey, completed 2,727 feet, flowing 500 bbls.

Humble Oil & Refining Co.'s No. 1 L. G. Hanson, James Hinds Survey, completed 2,724 feet, pumping 79 bbls. in 10 hours.

Humble Oil & Refining Co.'s No. 2 Martha Briscoe, James Hinds Survey, completed 2,702 feet, swabbing 1,000 bbls. daily.

Humble Oil & Refining Co.'s No. 1 Martha Briscoe, J. Hinds Survey, completed 2,710 feet, pumping 400 bbls.

Humble Oil & Refining Co.'s No. 2 J. D. Wright, Gerren Hinds Survey, completed 2,700 feet, swabbing 250 bbls. daily.

Humble Oil & Refining Co.'s No. 1-B B. Johnson, James Hinds Survey, completed 2,698 feet for 500 bbls.

Humble Oil & Refining Co.'s No. 5-B Moses & Baggett, completed 2,706 feet for 2,500 bbls., flowing.

Humble Oil & Refining Co.'s No. 7 J. B. Tiller, Gerren Hinds Survey, completed 2,729 feet, pumping, no gauge given.

Humble Oil & Refining Co.'s No. 7 W. O. Allen, completed at 2,773 feet, pumping 175 bbls.

Humble Oil & Refining Co.'s No. 2 L. G. Hanson, James Hinds Survey, completed 2,732 feet, pumping, no gauge given.

Gulf Production Co.'s No. 7 J. D. Wright, Gerren Hinds Survey, completed 2,678 feet, pumping 100 bbls.

Gulf Production Co.'s No. 9 W. L. Smith, A. Floyd Survey, completed 2,696 feet for 51 bbls. oil, 574 bbls. water daily.

Gulf Production Co.'s No. 9 R. W. Carter, Gerren Hinds Survey, completed 2,685 feet, 150 bbls., pumping.

Golden West Oil Co.'s No. 3 Malone, A. Floyd Survey, completed at 2,690 feet, swabbing 60 bbls.

Morgan Brothers' No. 1 Malone, A. Floyd Survey, completed at 2,605 feet, pumping 100 bbls.

Duval County

Simms Oil Co.'s No. 4 Dinn, Survey 666, completed at 1,743 feet for 35,000,-000-foot gas well.

Refugio County

Houston Gulf Gas Co.'s No. 7 Fannie Heard, completed at 3,679 feet, making estimated 60,000,000 feet of gas, 1,000 pounds rock pressure.

Houston Oil Co.'s No. 10 Rooke, completed 3,700 feet, estimated 2,000 bbls. of oil, making 500 bbls. on one-fourth inch choke.

Webb County

Magnolia Petroleum Co.'s No. 1 King-Benavides, Survey 694, Block 12, completed at 2,397 feet for 15,000,00-foot gas well.

Zapata County

T. P. Morgan's No. 1 Hinnant, Survey 74, has been completed at 1,614 feet for estimated 50-bbl. well.

ABANDONED TESTS

Webb County

Houston Oil Co.'s No. 4-D Benavides, Survey 753, Block 5, location only has been abandoned.

Houston Oil Co.'s No. 17-D Benavides,

(Continued on Page 89)

EDWARDS LIME SHOWING REPORTED SOUTHWEST OF SAN ANTONIO

By B. D. Stevenson

SAN ANTONIO, Tex., Apr. 22.—Bexar County had a "scare" Saturday when it was reported there was an Edwards lime well 11 miles southwest of San Antonio and 60 miles southwest of the Luling oil field which is the nearest Edwards lime production. Indian Creek Oil & Gas Co.'s No. 1 Wolfsohl, west of the Somerset Road and west of Leon Creek, at 1,597 feet early Saturday morning according to the drillers' report had a showing of oil in 2 feet of soft formation after going through 8 feet of hard cap and at 30 feet into the Edwards lime. There had been a little water at 1,580 feet but not enough that it could not be bailed down and some of the members of the company wanted to abandon it. Location was made by George F. Hinton of San Antonio. Saturday morning the hole was standing full of fluid and oil was dipped off the top. It looked like rather high gravity. The hole was drilled with cable tools and 5⅜-inch casing was being carried down. This will be pulled out and the hole reamed down for 6⅝-inch casing which will be set on the cap rock and cemented and the well then drilled in. It will probably be 10 days or two weeks before the test is made.

Bee County

Mission Drilling Co. is down about 2,-500 feet in No. 2 Ray near Pettus in the northern part of Bee County. No. 1 Ray completed as a gasser at about 2,900 feet was drilled by H. E. Hewitt and associates and purchased by Mission Drilling Co. and No. 2 Ray is the first test to be drilled since to develop the pool. A few more days drilling will tell what it is going to do.

In Gonzales County, Benedum & Trees' No. 1 Lamkin, several hundred feet south of the Empire Gas & Fuel Co.'s No. 1 Norwood, discovery oil well, is down 3,-800 feet. The discovery well is a producer at 3,779 feet but No. 1 Lamkin is down the dip and should pick up the sand somewhat lower. Thus far the discovery well and three or four dry holes constitute the field.

A deep test in the Randado Pool in Jim Hogg County blew up when the Magnolia quit No. 41 Merchant State Bank with a fishing job at 5,200 feet.

The Luling Field trend which lately has had a number of new tests is to get another. W. E. Clark has 1,400 acres near Kingsbury southwest of the Luling Field and will make a location and drill.

Donaldson Oil Development Co. failed to make a well out of its No. 1 Adams Co. in southeastern Medina County near Devine due to the hole caving in. The casing has been left in the hole and a second attempt may be made later. Another test will be drilled to the north at once and F. A. Lain blocked acreage still farther to the north and west and the Zigzag Oil Co. is making a location to drill on it. This is called the Devine structure in a state university bulletin issued some years ago and was the first classed as a dome. That was before the fault idea became so general in Southwest Texas. A few wildcats have been drilled in that area but only a few and now the attempt is being made to find production on the fault theory.

There is some new play and activity due in the Gulf Coast territory south from Corpus Christi. Activity has been rather intense north but some new activity is due to the south as some of the

(Continued on Page 89)

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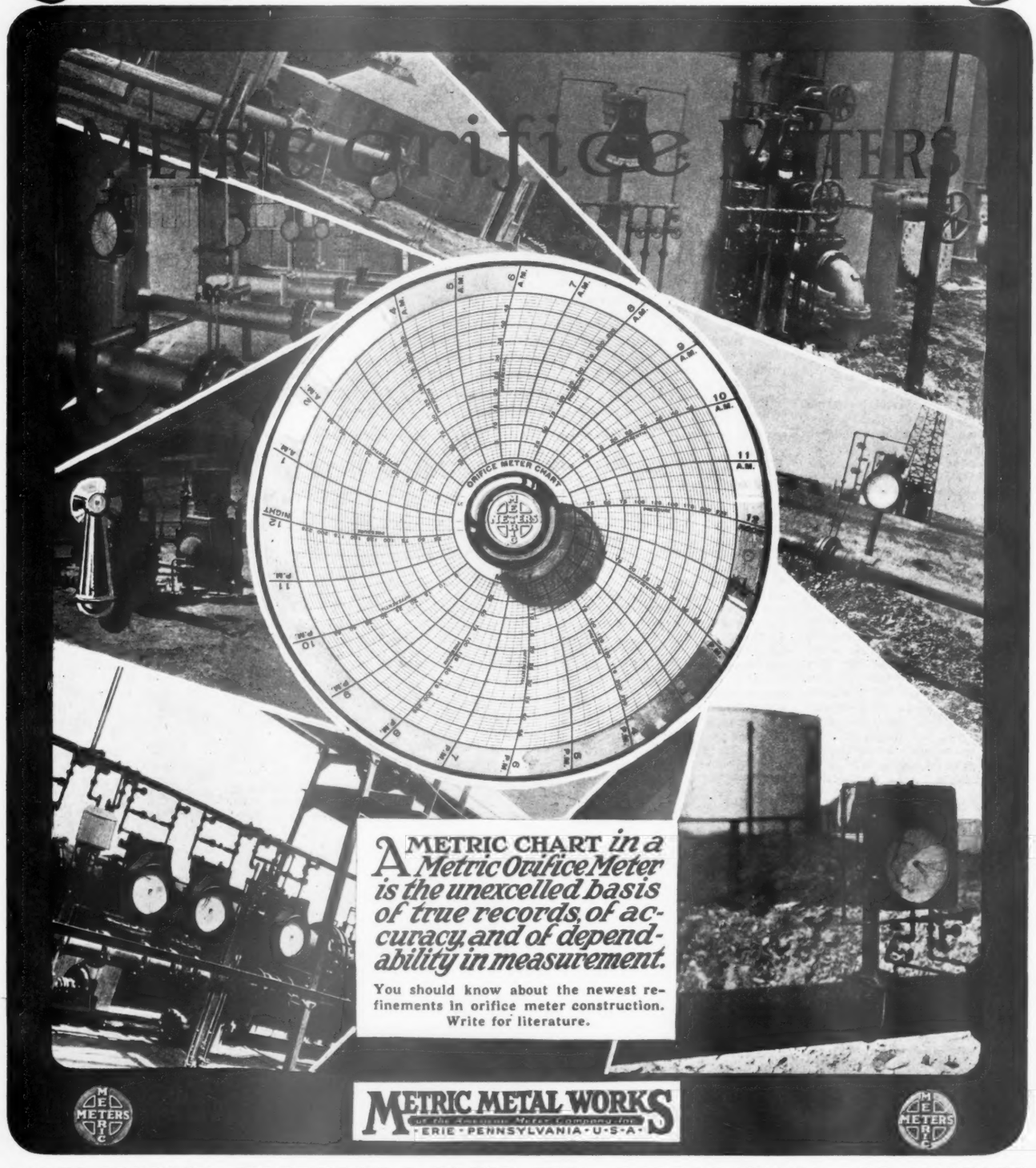

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Proving Up Southwest Pierce Junction

Another Salt Dome Prospect Probable at Lake Barre, Southern Louisiana. First Oil Found at Black Bayou

By Neil Williams
Staff Correspondent, Gulf Coast Fields

HOUSTON, Tex., Apr. 22.—Further proving up of the line of production on the southwest flank of the Pierce Junction Dome was accomplished during the week with the completion of Rio Bravo Oil Co.'s No. 13-A Settegast which was bailed in flowing an estimated 1,800 bbls. daily from a sand at a total depth of 3,655 feet. This was one of two good wells added by Rio Bravo Oil Co. at Pierce Junction and one of three brought in last week on the dome, which has been conspicuous by its many important extensions during the past several months.

Rio Bravo Oil Co.'s other Pierce Junction well was its No. 12-A Settegast, which came in flowing initially an estimated 2,500 bbls. daily from sand at 4,574 feet. This well, however, lies in the proved area on the west flank considerably to the north of the new production being developed on the southwest side. The third well was on the northeast flank, this being T. G. Shaw-Texas Exploration Co.'s No. 2 Fitzsimmons-Barrow which flowed 500 bbls. net oil at 3,869 feet.

No. 13-A Settegast is a northward offset to Harvey Smith and associates' No. 1 Herman estate, completed several weeks ago, and the two producers lie about midway between the west flank pool and Moody Corp.'s wildcat producer, No. 4-B Settegast, which opened production on the southwest flank. Rio Bravo already has location for Nos. 14-A and 15-A Settegast, the latter being 150 feet west of No. 13-A.

Lake Barre Salt Dome

Completions as a whole, although several good wells were brought in, offered very little of interest as far as extensions of production were concerned, Louisiana operations in particular have failed to bring out anything of importance in recent weeks with the passing to the background of the new pool on the south side of Old Hackberry Dome. In that State another salt dome prospect apparently has been proved out as a salt dome by the drill. This is at Lake Barre, southern Terrebonne Parish, where The Texas Company's No. 1 Lake Barre drilled into what is believed to be cap rock and at 747 feet is in a cavity losing returns.

Lake Barre is one of the nine geophysical domes taken over by The Texas Company from the Louisiana Land & Exploration Co. for development, on each of which The Texas Company will drill a minimum of four tests, except at East Hackberry, where the Louisiana Land & Exploration Co. was not the sole owner. The majority of those domes, including Lake Barre, are in Terrebonne Parish in the extreme southeastern part of the State where virtually no wildcatting has been done before. The Texas Company already has started actual drilling on three of these domes in Terrebonne Parish, and is moving in material and otherwise rigging up on the others, including one in Plaquemine Parish.

Of some interest is Shell Petroleum Corp.'s No. 9 Watkins at the Black Bayou Dome of Cameron Parish, Louisiana, some 12 to 15 miles to the west of the Hackberry domes, which might make a small pumper at the shallow depth of 861 feet. Shell, however, expects to deepen the hole. The test Saturday was swabbing and bailing with the oil rising at the rate of 32 bbls. daily in the hole. In the nine tests drilled or drilling at Black Bayou this is the first oil to be found and the well might be considered the discovery well of a new field but pending completions at this depth it cannot be stated whether the well would make a commercial pumper. Black Bayou, a geophysical dome, is controlled by the Shell Petroleum Corp., which at present has under way one other test, No. 6 Watkins, a deep hole, now at a total depth of 4,507 feet.

North Side of Humble

Deep sand production on the north side of Humble was extended approximately 800 feet to the northward by The Texas Company's No. 22 House, which blew in and flowed 641 bbls. of fluid, 32 per cent b.s. and water, in the first 12 hours. The oil is slightly higher than 26 gravity but unusually low for that deep production. The bottom of the hole is at 5,055 feet in sticky shale but approximately 190 feet of blank screen is set there throwing the production from a sand higher up. Although the production is the deepest on the north side of the dome it is not believed to open a new sand, the difference in the depths of that well and the nearest producers being in line with the natural dip away from the dome. Other than the fact that the well is slightly farther out from the dome than other north side producers there is no especial significance in its completion.

At DeWalt, Humble Oil & Refining Co. added two additional producers, Nos. 3 and 4 Brazos farms, the former flowing 1,200 bbls. daily at 3,568 feet and the latter 257 bbls. at 3,441 feet. These wells have boosted the daily average output of the dome nearly 14,000 bbls. which is considered an exceptionally good record for a salt dome field only slightly over a year old and not drilled in a reckless and competitive manner. The field is the third on the Gulf Coast, long since having passed Hull and Humble, formerly among the biggest producers, and promises to be a close contender with Pierce Junction for second place next to Spindletop.

Humble Oil & Refining Co. in its joint operations with the Valley Oil Corp. (H. T. Staiti interest) also was successful in completing two more producers at Raccoon Bend, Austin County, and in addition brought in a 15,000,000-foot gas well opening a new gas-producing horizon. The latter well, however, has been killed and will be deepened. It was completed at 1,847 feet. Humble and Valley's No. 1 Dietrichs was brought in flowing an estimated 1,000 bbls. of 32 gravity pipe line oil from sand at 3,317 feet and No. 3 Urban came in Saturday making an estimated 600 bbls. daily at 3,360 feet.

Southeast of Barbers Hill

In the deep sand area on the southeast side of Barbers Hill, another small producer was added in Joe Bashara's No. 1 Tarbutton, flowing 325 bbls., 2.3 per cent water, at 5,264 feet. Drilling is continuing active both in this area and in the other newly opened deep sand area on the southwest flank. Failure to bring in any sizeable wells at Barbers Hill in the past two weeks, together with the quitting of Yount Lee Oil Co.'s No. 3 Chambers County, southwest flank, completed three weeks ago, resulted in a sharp drop in the daily average production of the dome during the week. The field, which made as high as 12,000 bbls. daily and over, Saturday was making slightly over 9,000 bbls. daily.

At Spindletop, Yount Lee Oil Co. got two more wells in No. 99 McFaddin, south side, flowing an estimated 1,200 bbls. daily at 3,976 feet, and No. 77 Gladys City flowing 800 bbls. daily at 3,424 feet.

Old Hackberry's contributions like during the previous week were only two small wells, Rex Petroleum Co.'s No. 2 Noble, flowing 200 bbls. daily at 3,284 feet, and Sun Oil Co.'s No. 2 Vincent flowing 291 bbls. daily at 3,387 feet. Two tests were abandoned in the salt, Sunshine Oil Co.'s No. 1 Benoit, south side, being at a total depth of 2,101 feet, and Rycade Oil Corp. and Humble Oil & Refining Co.'s No. 1 Gulf Land, west side, being at 4,336 feet.

Other completions of the week were Republic Production Co.'s No. 103 Dolbear, Hull, flowing 700 bbls. net oil at 2,578 feet; Deutser Oil Co.'s No. 20 Trustee, Batson, pumping 15 bbls. net oil, 1,128 feet, and Fort Bend Oil Co.'s No. 3 Reviere, South Liberty, pumping 50 bbls., 2,317 feet.

Daily Average Production

Daily average production of Coastal fields fell off slightly during the week to 153,535 bbls., the decline being chiefly due to the substantial drop at Barbers Hill. Additional gains at Salt Flat resulted in another increase in the daily average for Southwest Texas fields. Figures for the two divisions by fields for the week ending April 20 are:

GULF COAST PRODUCTION

Texas

Allen	8
Barbers Hill	10,500
Batson	1,498
Big Creek	2,941
Blue Ridge	3,296
Brenham	150
Boling	1,965
Clay Creek	3,842
Damon Mound	680
DeWalt	13,415
Fannette	725
Goose Creek	6,428
High Island	1,408
Hull	9,333
Humble	6,109
Jasper	20
Markham	360
Nash	620
North Dayton	450
Orange	2,899
Orchard	463
Pierce Junction	15,898
Raccoon Bend	2,199
Saratoga	938
Sour Lake	2,718
South Liberty-South Dayton	5,460
Spindletop	32,138
West Columbia	6,322
Total	132,783
Total previous week	133,530
Decrease	747

South Louisiana

Anse La Butte	45
Bayou Bouillon	287
Edgerly	886
Jennings	868
Hackberry	7,391
Lockport	3,285
Sorrento	389
Starks	508
Sulphur	2,500
Sweet Lake	365
Vinton	4,193
Welsh	35
Total	20,752
Total previous week	21,067
Decrease	315
Total Gulf Coast	153,535
Total previous week	154,597
Decrease	1,062

Southwest Texas

Dale	530
Branyon	25
Bruner	41,923
Gonzales	90
Kingsville	281
Larremore	166
Luling*	11,414
Lytton Springs	1,045
McMullen	52
Medina	30
Miranda district	12,333
Refugio	2,201
Somerset	1,893
Yoast	1,683
Total	73,666
Total previous week	72,979
Increase	687

*Includes Caldwell County, 7,543 bbls.; Guadalupe County, 3,871 bbls.

Barbers Hill—Chambers County

Unice Oil Co.'s No. 1 Feldman, southeast flank, is drilling gumbo at 4,337 feet. Mills Bennett Production Co.'s No. 2 Smith is drilling lime rock at 5,100 feet. The latter's No. 1 Hamman-Arm-

(Continued on Page 126)

EAST CENTRAL TEXAS PRODUCTION SHOWS INCREASE OF ONLY 111 BBLS.

By Neil Williams

CORSICANA, Tex., Apr. 22.—There were no completions in the East Central Texas division and at the close of the week there was only one test expected in, Humble Oil & Refining Co.'s No. 1 Peter Holloway, a workover at Boggy Creek, Anderson County, which is waiting cement to set at 3,658 feet after plugging back from 3,767 feet where it was completed last September flowing 72 bbls. an hour. Daily average production of the division was steady with an increase of only 111 bbls.

At Boggy Creek, Humble's No. 1 Neches River, plugged back to 910 feet after drilling to 3,784 feet, is waiting cement to set. It will attempt to drill a straight hole, the old hole having been found considerably off. Humble's No. 1 Gauger is drilling shale at 3,952 feet, No. 2 Roberts rock at 1,684 feet, and No. 1 Holt sand at 485 feet. The latter is 4,000 feet north of production. No. 2-B Elliott & Clark is rigged and No. 2-A Todd is a derrick.

On the Bethel Dome, Anderson County, Pure Oil Co.'s No. 1 Jackson is building derrick. J. S. Cosden and associates' No. 2 Douglass, Keechi Dome, so far has failed to loosen stuck drill stem. It is in chalk at 3,861 feet.

Magnolia Petroleum Co.'s No. 1 Duran, Pine Hill, Rusk County, is standing at 355 feet, and Amerada Petroleum Corp.'s No. 1 Wade, Upshur County, is drilling hard chalk at 3,507 feet.

Lufkin Oil & Gas Co.'s No. 1 Collmorgan, Angelina County, has resumed operations after being delayed at 704 feet because of drill stem stuck. This is a shallow test. In Falls County, Caruth & Stewart have made location for No. 2 Flowers. Gruver & Stiles' No. 2 Stiles, Satan Survey, Falls County, is drilling lime at 992 feet. Humble Oil & Refining Co.'s No. 1 Pieper, same County, is drilling chalk at 720 feet. Killan & Phillips' No. 1 Jones, Falls County, has spudded. Yoast & Hicks' No. 1 Pamplin is drilling Georgetown lime at 3,805 feet.

In Freestone County, Haley & Young's No. 1 Night has drilled to 3,930 feet in shale but now has drill stem stuck. All operations in Henderson County and also Leon County are standing.

In Limestone County, C. F. Lyttle and associates' No. 1 Thompson is ready to resume drilling. It is in a sandy shale showing salt water at 6,045 feet. A. F. Richardson's No. 1 Jones is shut down in sandy shale at 1,402 feet. Bosque Oil & Gas Producing Co.'s No. 1 Johnson, McLennan County, is shut down in lime

(Continued on Page 89)

Expect Big Well on Rattlesnake Dome

Continental Oil Co.'s Discovery of Oil in Lower Pennsylvanian Principal Interest in Rocky Mountain Area

By Tolbert R. Ingram
Staff Correspondent, Rocky Mountain Area

DENVER, Colo., Apr. 20.—The discovery of oil in the lower Pennsylvanian formation in the Continental Oil Co.'s No. 17 on the Rattlesnake Dome in northwestern New Mexico continues to hold the principal interest in the Rocky Mountain area, the belief being general that a big well will result when the water is shut off. The Texas Production Co.'s No. 1 Lynch, in Lea County, which swabbed 639 bbls. in 12 hours, will not be deepened. Cranfill & Reynolds' No. 1 Meyer, 5½ miles north of its No. 1 Wilson, which is showing for a producer, is a new location. Midwest Refining Co.'s No. 19 Farnsworth, in the Jal district, is flowing water over the top and probably will be abandoned. The Texas & Pacific Coal & Oil Co.'s No. 1 State is showing a little oil and some water while making 6,000,000 feet of gas. George F. Getty, Inc., No. 4 Dooley, in Eddy County, flowed 763 bbls. in 12 hours when opened preliminary to swabbing. Flynn, Welch & Yates will drill another well near its No. 1 Jackson, northeast of the Artesia Pool.

In Utah, the Continental Oil Co.'s Boundary Butte test in San Juan County is showing more gas at 4,900 feet and rivaling the same company's No. 17 Rattlesnake in New Mexico in interest, the two wells being in approximately the same horizon. A show of oil in a 10-foot sand is reported in the Cisco district in Grand County in the Navajo Petroleum Co.'s No. 1.

Several Colorado tests, including two on the Moffat Dome, one on the Iles Dome, and one on the Tow Creek structure, are all on top of sands and ready to drill in and all will prove up new horizons or extend the area of producing sands. All are being drilled by the Texas Production Co. The Continental Oil Co. is starting a well in the Vineland district southeast of Pueblo, near the discovery, which is expected to settle the mystery concerning the show of oil in the first operation. Another show of high gravity oil has been made in the Lyons townsite in Boulder County, at 47 feet in C. E. Johnson's No. 2 Campbell, near two other freak wells, one of which is making either noninflammable gas or bad air, and the other showing almost pure kerosene. A new wildcat is being started near the town of Watkins in Adams County by Hattie M. Slatt, and the Raddatz, Vogel & Travis interests are drilling a test to the Sundance in the south extension of the Florence Pool.

The Carter Oil Co.'s No. 1 State, on the Billy Creek structure, in Johnson County, Wyoming, is developing into a freak well in which the sand rose to 300 feet from the bottom over night preventing the drillers from getting the tools on bottom. It is showing dead oil, but the gas and water have disappeared.

NEW MEXICO

The Continental Oil Co.'s discovery in the deep Pennsylvanian formation in its No. 17, on the Santa Fe Corp.'s Indian lease, C NE Section 2-29-19, on the Rattlesnake Dome in San Juan County, in northwestern New Mexico, continues to be the outstanding feature in the news of the Rocky Mountain area though there is no particular change from conditions as reported last week. Underreaming to lower the 4¾-inch casing to shut off the water just above the pay has commenced, but it probably will be several weeks before the hole can be enlarged to the bottom and a shutoff made. The company is not making any statements as to what the well will do in the way of production other than to say it looks commercial as it now stands though the amount of production has not been determined. From other sources comes the information that the well is flowing several hundred barrels of oil with the water encountered just above the pay. There is no doubt there is a heavy pressure back of the oil to force it over the top through a column of 6,700 feet of salt water, but whether this pressure all comes from the pay horizon or partly from gas above is not certain. The well entered the Pennsylvanian formation at 5,050 feet. Salt water in considerable quantities was found at 6,730-35 feet. A shale break was then encountered and at 6,770 feet the oil began coming in. There was a showing of high gravity oil, believed to be a distillate, just above the water horizon. Also at 6,553 feet it had considerable gas. The pay horizon topped at 6,770 feet was drilled only 1 foot when operations were suspended. It was found just 1,721 feet below the top of the Pennsylvanian.

While all kinds of estimates are being made as to the capacity of the well, these are all guesses and until the water is shut off there is no way even to approximate what it will do. It will be recalled that on October 9, 1925, this well, after setting the 20-inch on top of the Dakota at 710 feet, was rat-tailed into the Dakota sand with a 6-inch bit and made 1,250 bbls. in six hours, shooting the oil 200 feet over the top. This oil was cased off, as was also another flow of similar proportions in the second Dakota, after which the long, tedious and expensive drilling to the Pennsylvanian continued. The importance of the discovery is not confined to the proving of the deep sand on the Rattlesnake Dome for conditions are similar on a number of structures in that area and other into southeastern Utah and northeastern Arizona. Already operators holding leases in that area are looking into the situation with a view to determining upon future plans and other deep tests are considered practically certain. The Midwest Refining Co. controls the Hogback Dome where it has seven wells producing from the Dakota at around 600 feet, the oil being exceptionally high in gravity. The Table Mesa structure, controlled by the Continental company, has six wells producing from the Dakota. The Ute structure, which is deeper than the others, has three big gas wells in the Dakota drilled by the Midwest and the Producers & Refiners Corp. The Tocito, Beautiful Mountain and Chimney Rock structures, while failures in the shallow horizons, hold out possibilities in the Pennsylvanian which are not likely to be overlooked. The next big development affecting the situation in that district is looked for in the Continental's Boundary Butte structure in southeastern Utah which is showing very encouraging indications at this time.

Effect of Hoover Policy

In Lea County, in the southeastern part of the State, the confusion resulting from the new oil lease policy of the United States Government is holding back several new operations that were scheduled to get under way and is forcing drilling in other instances where permits still are in good standing. The Texas Production Co., which had 58 permits recommended for cancellation by the special committee appointed by Secretary Wilbur, will not drill any deeper on its No. 1 Beulah Lynch, NW cor. SE Section 34-20-34, at this time. It is shut in at 3,731 feet waiting for the completion of storage after swabbing 639 bbls. in 12 hours. Cranfill & Reynolds' No. 1 Wilson, NW NE Section 23-25-36, is still shut down in the lime at 3,355 feet waiting for storage. It was reported to have flowed 24 bbls. in 24 hours on April 11. This firm is moving in for its No. 1 Meyer, NE cor. SE Section 22-24-36, located 5½ miles to the north and a little to the west of its No. 1 Wilson. The Pueblo Oil Co.'s No. 1 Crosby, SW SW Section 29-25-37, has succeeded in cleaning the hole of the tools which were lost at a total depth of 2,614 feet. It is making 2,000,000 feet of gas. The Midwest Refining Co.'s No. 19 Farnsworth, SW SW Section 12-26-37, on the east side of the Jal district, is flowing sulphur water over the top from a total depth of 4,065 feet and probably will be abandoned. Its No. 22 Gregory, SE SW Section 31-25-37, is drilling water well and has rig up ready to commence spudding. Same firm's No. 31 Capps, SW cor. Section 3-19-38, in the Hobbs district, is drilling at 790 feet in red shale. A. D. Morton's No. 1 C NW Section 32-11-38, in the Tatum district, is bottomed in sand at 1,640 feet and underreaming the 10-inch at 1,596 feet. It is making 4½ bbls. of water from 1,600 feet. The Vacuum Oil Co.'s No. 1 State, center west section line Section 13-17-34, is drilling at 3,115 feet in anhydrite and fighting caving ground. Henderson, Dexter & Blair's No. 1 McDonald & Jewett, SE cor. Section 18-20-34, is drilling in anhydrite at 2,973 feet. The last salt was at 2,960 feet. The salt was topped at 1,505 feet. The Texas & Pacific Coal & Oil Co.'s No. 1 State, SE SW Section 22-23-36, is drilling at 3,436 feet in gray and brown lime and making 6,000,000 feet of gas. Water rose 100 feet in the hole in 6 hours. The Empire Gas & Fuel Co.'s No. 1 Closson, NE NW SE Section 6-22-36, is building road and digging cellar, and its No. 2-B State, NW SW SE Section 8-21-35, has rig up.

Eddy County

In Eddy County, George F. Getty Inc. No. 4 Dooley, SE NE Section 2 20-29, in the Twin Mounds Pool, 1 miles southeast of the Artesia Pool, sur prised everybody by its performance o April 11 when it flowed 763 bbls. i 12 hours from a total depth of 1,35 feet (corrected). It was opened prepara tory to swabbing. Previously it ha flowed 30 bbls. in 6 hours. The o has an asphalt base and is 21 degree gravity. This well is almost three fourths of a mile to the northwest o its No. 1 Nicholas, NW NW Sectio 25-20-29, which was completed early 1928 at 1,383 feet with an initial produc tion of 70 bbls., and half a mile sout and a little west of No. 1 Hinkle, NE cor. Section 23-20-69, which flowe 69 bbls. natural first 24 hours afte being tubed with 3-inch pipe. Thes wells are shut in for lack of pipe lin facilities. The area northeast of th Artesia Pool where Flynn, Welch Yates recently completed its No. 1 Jack son, is receiving considerable attention This firm has made a location in th SE cor. SW Section 12-17-30, half a mile to the northwest of the Jackso well, and the Grayburg Oil Co.'s No.

(Continued on Page 98)

OKALTA WELL ESTIMATED 600 BBLS.; UNDER CONTROL AFTER BLOWOUT

By Victor Lauriston
Staff Correspondent, Canadian Fields

CHATHAM, Ontario, Apr. 20.—In the Turner Valley Field southwest of Calgary, Okalta Oils' No. 1, LSD 1, Section 1-20-3w5, which came back into production on March 25, has been cleaned out and got under control, after blowing wild for nearly two weeks. The well got production last November in the deep lime at 5,040 feet, with an estimated peak recovery of around 600 bbls., but toward the end of December froze off. In cleaning out the hole with the diamond drill, it was found to be blocked by "pinched" casing. Drilling crews worked for 14 hours from dawn till dark pulling the collapsed casing. The work was done under very difficult conditions, the men working in an atmosphere heavily permeated with wet gas. The gas was icy cold, and the drillers more than once collapsed under the effects of the fumes and numbness, and had to be dragged away from the rig until they recovered. Toward nightfall the last of the casing was removed, when men with gas masks entered the cellar and after a 2-hour struggle succeded in connecting the big flow with the four separators. From below the pinched casing the drillers removed 240 feet of casing completely blocked with ice, which looked like rock salt and had a peculiarly pungent odor. Samples of this are being analyzed in the hope that light will be thrown on the freezing problem which has affected many deep lime producers in the Turner Valley. At last reports the wet gas flow from Okalta's No. 1 was placed at 25,200,000 feet, and it is estimated the crude naphtha recovery with the separators in full operation will run around 600 bbls. a day, or better. Figures last December were based on incomplete recovery, two separators having since been connected to handle the production.

Okalta's No. 2, LSD 8, Section 1-20-3w5, which has been producing around 50 bbls. a day of light crude at 3,320 feet depth, will be carried down to the lime horizon. Preparations are now being made for deepening. Okalta's No. 3, LSD 9, same section, has resumed drilling after straightening a crooked hole at 2,500 feet.

Royalite Operations

Royalite Oil Co.'s No. 14, LSD 4, Section 7-20-2w5, after encountering large gas flows at two levels, is drilling 430 feet in the lime at 3,650 feet. Production at the higher levels failed to hold up. Royalite's No. 12, LSD 3, Section 13-20-3w5, is drilling at 3,875 feet. Royalite's No. 16 LSD 2, Section 12-20-3w5, is at 5,060 feet and trying to release a liner. Royalite's No. 17, LSD 13, Section 6-20-2w5, which had some light crude production at 3,965 feet, is rigging up to go deeper. Royalite's No. 19, LSD 5, Section 6-20-2w5, is at 4,300 feet and running 8¼-inch casing. Royalite's No. 20, LSD 7, Section 12-20-3w5, is at 3,212 feet and running tubing. Royalite's No. 21 is drilling at 3,508 feet. Royalite's No. 23, NW Section 31-19-2w5, is drilling at 1,771 feet. Roy-

(Continued on Page 121)

Proves Eastern End Santa Fe Springs

Rohdes' Well Will Do Better Than 5,000 Bbls. of 35.1 Gravity Oil and 5,000,000 Feet of Natural Gas

By L. P. Stockman
Staff Correspondent, California Fields

LOS ANGELES, Calif., Apr. 20.—Considerable activity is getting under way in the extreme southeastern part of the Santa Fe Springs Field where O. J. Rohdes' No. 2 was brought in late last week under a natural flow doing 3,000 bbls. of unusually clean 36.1 gravity oil daily from the Clarke zone at 7,407 feet. This new producer, which would do better than 5,000 bbls. of oil and 5,000,000 feet of natural gas per day if opened up, has been severely pinched back. It is producing around 1,500 bbls. of oil and 1,400,000 feet of exceedingly wet gas which has a gasoline content of 3 gallons for each 1,000 feet of gas treated. This well definitely proves up the eastern end of the Santa Fe Springs Field for substantial production, so far as the Clarke zone is concerned. Rohdes' new well is on Lot 13, a 1-acre parcel of the Sunshine farms, this acreage before subdivision being a component part of the Union Oil Co.'s Meyer lease where the first commercial producer was finished in the Santa Fe Springs Field a number of years ago. No. 4 Meyer of the Union Oil Co., a small upper zone producer, is just north of and within a few hundred feet of Rohdes' completion. The large production shown by Rohdes' well came as a distinct surprise to many as Sunshine Acres was generally believed to mark the extreme eastern end and was expected to reflect an edge condition, although this area presented an attractive possibility for extension work. It required considerable optimism on the part of Rohdes to undertake this project in the face of previous unfavorable development and generally prevailing dubiousness, as the well is only a few blocks south of the Standard Oil Co.'s No. 2 Brownrigg-Keller, abandoned as a dry hole at 7,212 feet several years ago.

Rohdes' new completion has changed the entire outlook so far as the extreme eastern end of the Santa Fe Springs Field is concerned and a considerable portion heretofore considered barren may ultimately be found productive with deeper drilling. This is especially significant considering the possibility production may be secured below the 8,000-foot level when drilling operations are carried down to that point as correlation work indicates the probable existence of another 1,000 feet of favorable formation below the top of the recently discovered Clarke horizon. The Plymouth Petroleum, Fox, Willburton & Wilson, L. T. Edwards, Garliepp & Mack, Cypress Oil Co., Union, Associated, Western Oil & Refining and Signal Oil & Gas are all expected to initiate development work in this section shortly. A number of new wells are also scheduled to be started on other 1-acre parcels in the Sunshine Acre farms east of Rohdes' new producer. Four new locations have already been started since the completion of Rohdes' producer and another few weeks should witness the initiation of intensive development on near-by leases, especially on acreage nearer the apex of the structure.

Deep Clarke Horizon

The inability to shut off subsurface water in the deep Clarke horizon has greatly retarded the completion of new wells in the Santa Fe Springs Field during the past several weeks but this condition is more or less artificial and due to the mechanics of drilling. Nearly all operators are passing up the Nordstrum and Buckbee zones to participate in flush production of the O'Connell and Clarke horizons, which have been definitely proven as highly prolific. Each of these zones will no doubt be an important factor in future production as existing water trouble will eventually be overcome. Rohdes failed to encounter the overlying O'Connell zone in his No. 2 Sunshine Acres, in the extreme eastern part of the field but the Union's No. 10 Howard, nearer the apex, revealed its potentialities as this well blew in flowing 6,025 bbls. per day from 6,565 feet. The Texas Company's No. 4 Baldwin, approximately 750 feet southwest of the Union's No. 10 Howard, also revealed the prolific tendencies of the O'Connell zone as it blew in doing 6,700 bbls. of exceptionally clean 34.6 gravity oil daily from 6,715 feet. This new well, flowing through a three-quarter-inch bean under a pressure of 1,300 pounds, is producing from 391 feet of formation as the 6⅝-inch water string was landed and cemented at 6,324 feet.

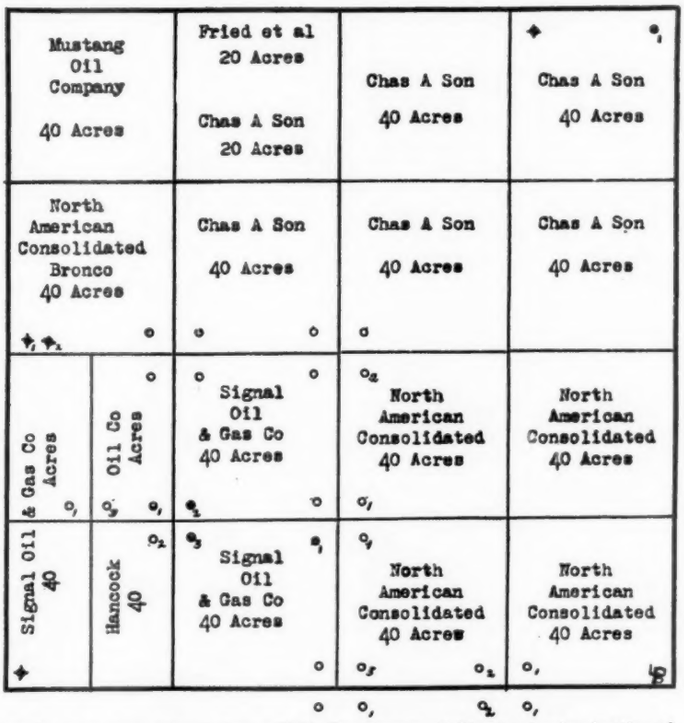
No. 8 on Mattern Lease No. 2, another deep zone completion of The Texas Company this week, also revealed the productivity of the O'Connell zone as it came in flowing 2,915 bbls. of clean 34.8 gravity oil daily from 6,420 feet. This well, flowing through a three-quarter-inch bean under a pressure of 1,370 pounds, only has a penetration in the oil sand of 10 feet, the 7-inch water string having been landed and cemented at 6,410 feet. No. 3 Green of the Associated, another O'Connell zone completion, blew in late in the week doing 4,475 bbls. of 35.1 gravity oil daily from 6,915 feet. In addition to No. 10 Howard, finished in the O'Connell zone, the Union Oil Co. also completed No. 11 Farwell which came in under a natural flow doing 2,330 bbls. daily from the Buckbee zone at 5,865 feet. No. 19 G. H. N. of the Shell was another Buckbee zone completion listed although originally scheduled for completion in the Clarke zone. It blew in making 2,940 bbls. daily from 5,940 feet during a water test, and will be allowed to remain on production indefinitely unless water trouble develops, in which event drilling will be resumed. The General Petroleum is still the largest single producer in the Santa Fe Springs Field with a current daily output of 35,000 bbls. The Union is next in line with 34,000 bbls., followed by The Texas Company, with 20,000 bbls. per day.

TANKER SHIPMENTS FROM LOS ANGELES TO ATLANTIC AND GULF COAST PORTS

Commodity—	Total this week	Daily average	Total last week	Daily average	This year to date	Same time last year
Crude oil	.....	.....	.....	.....	328,410	1,859,261
Fuel oil	.....	.....	.....	.....	49,950	.....
Diesel and gas oil	.....	.....	.....	.....	800,124	681,938
Gasoline	343,748	49,107	364,212	72,030	5,954,817	3,321,312
Naphtha distillate	.....	.....	.....	.....	81,750	.....
Coastwise—						
Crude oil	310,762	44,395	462,013	66,002	8,141,129	5,780,987
Fuel oil	113,005	16,144	754,300	107,757	6,496,143	6,110,348
Diesel and gas oil	105,270	15,039	24,455	3,494	457,492	432,702
Gasoline	224,610	32,087	176,360	25,194	3,355,000	3,781,749
Kerosene	.....	.....	1,697	242	8,187	24,415
Naphtha distillate	.....	.....	.....	.....	.....	171,566
Exports—						
Crude oil	135,990	19,427	203,427	29,074	1,529,373	744,226
Fuel oil	504,676	72,097	268,120	38,303	5,431,704	8,190,548
Diesel and gas oil	19,907	2,844	21,595	3,085	689,454	925,358
Gasoline	255,971	36,567	165,007	23,572	2,863,430	1,536,623
Kerosene	.....	.....	.....	.....	795,776	1,529,919

TANKER SHIPMENTS FROM SAN FRANCISCO TO ATLANTIC, GULF COAST PORTS

Diesel and gas oil	.....	.....	.....	.....	.....	342,425
Gasoline	.....	.....	80,362	11,480	848,607	813,509
Lubricants	.....	.....	.....	.....	.....	138,769
Coastwise—						
Fuel oil	.....	.....	95,980	13,711	848,534	1,174,866
Diesel and gas oil	49,998	7,143	1,498	214	234,220	98,436
Gasoline	57,174	3,453	181,801	25,972	1,090,386	1,229,971
Kerosene	.....	.....	7,443	1,063	37,135	75,640
Exports—						
Crude oil	50,150	7,164	.....	.....	121,603	65,563
Fuel oil	.....	.....	.....	.....	241,671	730,162
Diesel and gas oil	60,500	8,643	.....	.....	124,838	10,400
Gasoline	235,100	33,586	.....	.....	1,859,718	1,437,445
Kerosene	95,590	13,656	.....	.....	199,428	307,089
Lubricants	3,995	571	.....	.....	17,688	.....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North American Consolidated 40 Acres

Section 8-11n-23w, Midway Sunset Field, Kern County, California, showing location of Signal Oil & Gas Co.'s 2,000-bbl. brown shale producer and resulting work already under way.

Midway-Sunset

Completion of a 2,000-bbl. well by the Signal Oil & Gas Co. within the past fortnight has greatly revived interest in Midway-Sunset Field, Kern County, which has proven extremely erratic. Brown shale production in this district, unlike the output of wells completed in fields of recent origin in the Los Angeles Basin, shows a considerable variation from well to well. The Maricopa brown shale has yielded a number of large flowing wells during the past several years but lenticular conditions have prevented the development of substantial production over any extensive area. The Obispo Oil Co. focused attention on this district in 1925 after an enforced dormancy of several years due to the development of substantial production in the Long Beach, Huntington Beach, Santa Fe Springs and other Los Angeles basin fields opened up subsequent to 1921. The Obispo's No. 6, which came in flowing better than 5,000 bbls. per day from the Maricopa brown shale a few years ago, resulted in the drilling of a number of wells in the immediate locality but none showed substantial production, notwithstanding they were located within a few hundred feet of the discovery. The erratic tendencies of brown shale production in the Midway-Sunset Field of Kern County have resulted in considerable speculation since completion of the Signal Oil & Gas Co.'s No. 2 Sheehan, which recently came in flowing 2,000 bbls. per day. Operators are wondering if this will be another erratic area marked by spotted production due to lenticular conditions or whether this formation will be found generally productive.

The Signal Oil & Gas Co.'s new well, located in the NE of the SW of Section 8-11-23, has greatly stimulated activity on adjoining acreage and tentative locations have already been staked for a number of new wells. The accompanying diagram showing individual holdings in the immediate locality indicates present and projected work.

Correlation Difficult

The erratic tendencies of the Maricopa brown shale have deterred the drilling of new wells on numerous occasions, as correlation work is extremely difficult. Larry Porter, now assistant chief geologist of the Richfield Oil Co., made a detailed survey of Section 8 more than two years ago and ventured the opinion at that time that brown shale production could be anticipated. Porter's report, which had almost been forgotten, calls attention to the fact that there never has

been an adequate deep test drilled into the brown shale on Section 8-11-23 to either prove or disprove the existence of oil production, notwithstanding geologic evidence is more favorable for production in the brown shale than against it. He further stated in a written report that subsurface correlations have shown there are existent buttress sands coming off the brown shale contact that are equivalent to the subsurface horizon of the Thirty-five anticline, and since only the upper zones had been tested in Section 8 there were still possibilities, especially in the northeast quarter, of obtaining production in the Etchegoin producing zones which would be equivalent to the Calitroleum and Bush zones of the Thirty-five anticline. Charles A. Son, who holds considerable acreage adjacent to the Signal Oil & Gas Co.'s new well, finished a 125-bbl. pumper from the upper shallow zone on the 40-acre Broncho lease more than 18 years ago. This property was sold by Son in 1910 for $1,000 per acre in addition to the cost of the initial shallow zone producer which aggregated $26,666. The discovery of oil on the Bronco lease as shown by the accompanying diagram resulted in the last patent granted previous to President Taft's withdrawal of the naval reserves in 1910. Development of adjoining acreage has been held up for a number of years, and title to much was not secured until the issuance of a preferential permit in 1922 following the surrender of application for permit in 1920. Operators holding acreage adjacent to the Signal Oil & Gas Co.'s discovery have tentatively agreed to refrain from competitive drilling and while no well will be located within 300 feet of any property line this agreement does not limit future development in the interim of any lease.

Long Beach

The Richfield Oil Co. carried off completion honors in the Long Beach Field by finishing two new producers, one of which showed substantial production. This was No. 4 Bernstein, which came in doing 2,950 bbls. of clean 30.2 gravity oil and 3,400,000 feet of saturated gas daily from 7,335 feet. A 5¾-inch combination string cemented through perforations at 6,189 feet was used in the completion of this new well which has a penetration in the oil sand of 1,146 feet. No. 1 Butler, the Richfield's other current completion, was somewhat smaller as it showed an initial of only 1,840 bbls. daily from 7,101 feet. The output is clean, and should hold up in good shape as this new well is drawing from 925 feet of oil sand. The Dabney-Johnston Oil Corp. and the Union Oil Co. also chalked up completions and both are expected to list additional wells. The former, running 18 strings of tools, successfully completed No. 25 flowing 1,940 bbls. of unusually clean 27.9 gravity oil daily, the hole being carried to 6,600 feet and finished with a 5¾-inch oil string cemented through perforations at 5,471 feet. The Union's new addition to its list of producers was No. 1 Malin, which came in flowing 2,005 bbls. of 29.2 gravity oil daily from 7,012 feet, the hole having been finished with a 6⅝-inch oil string cemented through perforations at 6,183 feet. No. 22 Long Beach Community, which the Union finished last week, failed to hold up as water broke in shortly after completion and will require corrective work as the output is cutting 60 per cent water. The Shell finished No. 10-A Pickler flowing 640 bbls. daily from 6,560 feet but, like several other recent completions in the immediate area, is showing an excessive water content, the cut in this instance approximating 25 per cent. No. 11 Pickler was completed a few days ago at 6,728 feet and while substantial production was anticipated due to the fact that over 1,500 feet of oil sand was opened up the well failed to come up to expectations as it is only doing around 450 bbls. per day. The Woolner Oil Co. chalked up a nice producer when No. 3 Osborne was put on production doing 1,920 bbls. of clean 30.1 gravity oil daily from 7,265 feet.

The Shell, although it is by far the largest single producer in the Long Beach Field, with a current daily production of 50,000 bbls., will probably wind up a large part of its development program in this area in the very near future. The company is only running 12 strings of tools and future work in this area will be rather limited. The Richfield Oil Co., which has also experienced exceptionally successful development at Long Beach, is working on only two incompleted drilling projects and future activities will be concentrated on the rejuvenation of producing wells which might justify an expenditure through the stimulation of production The Richfield is running 27,000 bbls. of pipe line oil out of the Long Beach Field and is second only to the Shell, which concern discovered this prolific area. The Texas Company, with 15,000 bbls. per day to its credit, is the third largest producer at Long Beach, followed by Dabney-Johnston with 10,000 bbls. per day, Union with 6,000 bbls. and the General Petroleum with 4,000 bbls.

Seal Beach

Development work in the Seal Beach Field resulted in the completion of two wells and a check of drilling operations indicate the probable completion of several more in the very near future. Both projects finished during the past week were originally completed in the upper zone but were subsequently carried down into the lower horizon due to a decline in production. The Marland's No. 6 Selover, one of these projects, was returned to production a few days ago flowing 1,698 bbls. of clean 26.9 gravity oil daily after being redrilled and deepened to 5,420 feet. This well was originally completed in the Bixby zone flowing 2,145 bbls. daily from 4,912 feet in August 1927. No. 6 San Gabriel of the Standard was on about a par with No. 6 Selover as this well tanked 1,650 bbls. of clean 26.5 gravity oil during the initial 24-hour test following recompletion. It was carried down to 5,121 feet and finished with a 4¾-inch liner carrying 14 feet of perforated. The 6⅝-inch water string was landed and cemented in this well at 4,973 feet. The Standard's next completion at Seal Beach should be No. 20 San Gabriel and this well will be followed into production by Nos. 21 and 22, both rotating ahead below the 4,000-foot level. The Marland should finish Nos. 7 and 23 on the Bixby lease in the very near future, while the Associated should bring in No. 13 Bryant along about the same time.

Potrero

The Potrero Field is witnessing a revival of development work similar in some respects to that following completion of the Associated's discovery well in the area more than a year ago. The initial extension work undertaken at Potrero was centered in the town lot area south east of the Associated's discovery. Activity at present is limited to the town lot area northwest of the Associated's holdings where the California Eastern Co.'s No. 1 Pollard has shown some evidence of resulting in commercial production. Promiscuous development in the subdivided area southeast of the Associated's holdings proved disastrous to a number of operators, as not a single well beyond the Associated's holdings produced any oil and were eventually abandoned as dry holes. Operators are naturally wondering if the northwest area will produce a repetition of this condition where about 12 wells were spudded in simultaneously only to find out subsequently that faulting in the area precluded the development of commercial production. Regardless of the outcome of development work in the northwest section, there is no justification for the large amount of development work getting under way. Not a single barrel of oil has been produced by any company except the Associated, although the California Eastern's No. 1 Pollard recently made a short flow of water which was contaminated by oil. This well cored a limited amount of oil sand several weeks ago but the company has been unable to effect a satisfactory water shutoff.

J. A. Woodward's No. 1 Thornton also showed a little oil sand but failed to impress the operator and drilling was continued. Max Pray and the Cypress Petroleum recently spudded in new wells in this area and two more, No. 1 Peterson of the Midland Oil Co. and No. 1 Parcel of the Petroleum Securities are also scheduled for early work. Recent developments in the Lawndale Field and successful work in the southern end of the Potrero Field justifies the suspension of all unnecessary drilling at Potrero pending the outcome of work on the California Eastern's No. 1 Pollard and J. A. Woodward's No. 1 Thornton, both of which have reached the critical depth and should go a long way toward determining the future status of this area.

Inglewood

The Standard successfully finished well No. 59 on the Los Angeles Investment Lease No. 1 in the Inglewood Field as it is making 752 bbls. of clean 20.5 gravity oil. This new producer, which was bottomed at 2,650 feet and finished with an 8⅝-inch oil string carrying 1,215 feet of 80 mesh screen, just about concludes the Standard's lease requirements in this area. The Brownmoor Oil Co., which recently took its No. 7 off production for a deep test, has not yet begun to make new hole and it will probably be another 60 days before this project has been cleaned out and carried down deep enough to pick up the anticipated pay. The Brownmoor's acreage in this field is

(Continued on Page 125)

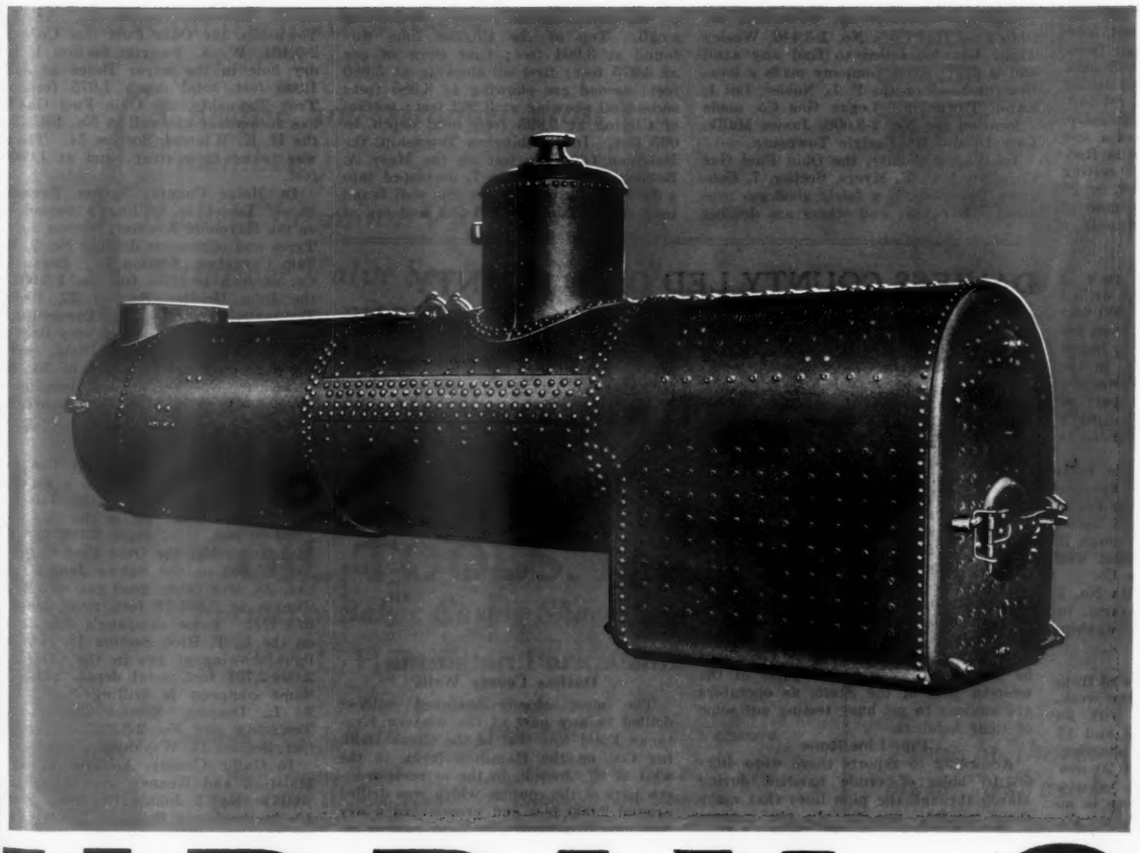
IMPORTANT NORTHERN CALIFORNIA WILDCATS

Company, well and location—	S-T-R	Depth	Status
Standard, No. 5-9 Saticoy, Ventura County	10- 2-22	5,690	hd. sd. drilling
American Oil Co., No. 1 Camarillo, Ventura County	33- 2-20	1,040	hd. sd. drilling
Bolsa Chica, No. 1 Temescal, Ventura County	4- 4-18	769	cleaning out
The Texas Company, No. 1 Hueneme, Ventura County	Lot-82	1,691	hd. sd. drilling
The Texas Company, No. 1 Wiley Canyon, Ventura Co.	2- 3-19	510	suspended
Superior Oil Co., No. 1 Santa Paula, Ventura County	14- 4-21	mtl.	building rig
Craise, F. A., No. 1 South Mountain, Ventura County	17- 3-21	rig	suspended
Miley, E. J., No. 2 Casitas, Ventura County	7- 3-23	1,090	rd. sd. drilling
Miley, E. J., No. 1 Red Mountain, Ventura County	11- 3-24	mtl.	building rig
Shell, No. 1 Simi, Ventura County	31- 3-17	2,760	hd. sd. drilling
Continental, No. 1 Sulphur Mountain, Ventura County	21- 4-22	3,765	suspended
Continental, No. 2 Sulphur Mountain, Ventura Co.	22- 4-22	6,740	sd. sh. drilling
Lockwood Oil Co., Well No. 1, Ventura Co.	28- 8-21	....	location
Milham Expltn., No. 1-A Buttonwillow, Kern County	8-28-23	4,662	gas well idle
Milham Expltn., No. 2 Buttonwillow, Kern County	8-28-23	2,730	gas well idle
Milham Expltn., No. 3 Buttonwillow, Kern County	8-28-23	2,694	gas well idle
Milham Expltn., No. 4 Buttonwillow, Kern County	6-28-23	2,670	gas well idle
Milham Expltn., No. 5 Buttonwillow, Kern County	5-28-23	2,500	gas well idle
Milham Expltn., No. 6 Buttonwillow, Kern County	8-28-23	2,676	gas well idle
Milham Expltn., No. 7 Buttonwillow, Kern County	6-28-23	2,720	suspended
Milham Expltn., No. 8-A Buttonwillow, Kern County.	8-28-23	2,673	gas well idle
Doheny-Stone, No. 1 Salisbury, Kern County	7-29-24	4,750	abandoned
Lincoln Drlg. Co., No. 1 Buttonwillow, Kern County	6-28-23	190	abandoned
Richfield Oil Co., No. 2 Semitropic, Kern County	36-27-23	4,412	br. sh. drilling
Stabler, W. W., No. 1 Comanche Point, Kern Co.	23-32-29	3,409	suspended
Symark Oil Co., No. 1 Edison, Kern County	24-29-29	1,230	suspended
Midway Northern, No. 1 Edison, Kern County	29-29-30	3,841	suspended
Elmer Oil Co., No. 1 Shafter, Kern County	8-28-25	6,100	cleaning out
Elmer Oil Co., No. 1 Bena, Kern County	15-30-30	1,652	sd. sh. drilling
Elmer Oil Co., No. 1 Rosedale, Kern County	33-29-26	2,480	fishing
Shell Oil Co., No. 1 Lerdo, Kern County	5-29-27	1,030	hd. sd. drilling
General Pet., No. 1 McFarland, Kern County	25-26-25	943	hd. sd. drilling
Union, No. 2 San Emidio, Kern County	5-10-21	2,694	hd. sd. drilling
Currency Pet. Co., No. 1 Vineyard, Fresno County	28-21-14	1,770	gr. sd. drilling
Currency Pet. Co., No. 2 Vineyard, Fresno County	14-21-14	260	sd. drilling
Hornaday & Huggins, No. 1 Kerman, Fresno County	32-14-18	2,800	sd. sh. drilling
K. C. L. Oil Co., No. 1 Joaquin Ridge, Fresno County	7-19-15	114	suspended
Thomas Pet. Co., No. 1 Krayenhagen, Fresno County	33-22-17	568	suspended
Union, No. 1 Huasna, San Luis Obispo County	34-32-15	3,454	br. sh. drilling
Union, No. 1 North Huasna, San Luis Obispo County	12-32-14	3,199	hd. sd. drilling
Panorama Oil Co., Well No. 1, San Luis Obispo County	7-31-21	3,540	hd. sd. drilling
Shell, No. 2 Guadalupe, Santa Barbara County	36-10-35	1,397	sd. sh. drilling
Shell, No. 1 Guadalupe, Santa Barbara County	25-10-35	3,000	sd. sh. drilling
Shell, No. 2 Goleta, Santa Barbara County	36- 5-31	3,071	sespe-drilling
Union, No. 1 Buel Canyon, Santa Barbara County	X- 7-31	mtl.	building rig.
Western Gulf, No. 1 Drake, Santa Barbara County	.....	mtl.	building rig.
Standard, No. 1 Point Conception, Santa Barbara Co.	X- 5-34	2,016	sd. sh. drilling
Standard, No. 1 Tortuga Canyon, Santa Barbara Co.	.....	2,241	sd. sh. drilling
Olympic Oil & Refg. Co., No. 1 Mesa, Santa Barbara	X- 7-28	2,456	suspended
Bankline Oil Co., No. 1 Mesa, Santa Barbara County	X- 4-27	4,272	sespe-drilling
Exeter Oil Co., No. 1 Mesa, Santa Barbara County	X- 4-27	3,195	sespe-drilling
Nevada Standard, No. 1 Goleta, Santa Barbara County	10- 4-28	3,285	sd. sh. drilling
General Pet., No. 1 Elwood, Santa Barbara County	21- 4-28	753	sd. sh. drilling
Padre Oil Co., No. 1 Dos Pueblos, Santa Barbara Co.	18- 4-27	2,429	sd. sh. drilling
System Oil Co., No. 1 Orcutt, Santa Barbara County	36-10-34	498	fishing
American Oil Co., No. 1 Summerland, Santa Barbara	33- 4-25	698	sd. drilling
Getty, Geo. F., No. 1 Summerland, Santa Barbara Co.	32- 4-25	3,090	cleaning out
Shell, No. 1 Summerland, Santa Barbara County	18- 4-25	....	grading
Channel Oil Co., Well No. 1 Santa Barbara County	29- 4-27	6,304	recemented
Channell Oil Co., No. 1 Fellowship, Santa Barbara Co.	29- 4-27	629	surface pipe
Continental, No. 1 Carpenteria, Santa Barbara Co.	33- 4-25	4,130	fishing
Continental, No. 2 Carpenteria, Santa Barbara Co.	33- 4-25	rig	rigging up
Elwood Consd., No. 1 Goleta, Santa Barbara County	8- 4-29	3,310	recemented
Colusa Oil Co., Well No. 1, Colusa County	31-15- 4	594	hd. sd. drilling
Italo American, Well No. 1, Colusa County	20-13- 3	695	hd. sd. drilling
Nuna Oil Co., Well No. 1, Colusa County	19-15- 5	400	suspended
North Counties Oil Co., Well No. 2, Humboldt County	36- 2- 1	2,205	suspended
Humboldt Oil Co., Well No. 1, Humboldt County	6- 2- 1	3,041	redrilling
Applegate & Renshaw, Well No. 1, Merced County	24- 6-10	3,693	br. sh. drilling
Kuhns, H. L., Well No. 1, Merced County	8-12-19	350	gr. sd. drilling
Calhoma Oil Co., No. 1 Livermore, Alameda County	9- 3- 3	1,544	cemented
Foster & Hammill, Well No. 1, Alameda County	21- 3- 3	465	suspended
R. Y. Hanlyn, Well No. 1, Alameda County	3- 5- 2	360	suspended
Shell, No. 1 Dudley, Monterey County	15-22- 9	1,960	hd. sd. drilling
Union, No. 1 San Lucas, Monterey County	8-22- 8	mtl.	building rig
Marland, No. 1 Bradley, Monterey County	32-24-11	4,863	cemented
Tux Oil Co., No. 1 Los Gatos, Santa Clara County	15- 8- 1	830	sd. sh. drilling
Dudley Ridge Synd., No. 1 Tulare, Kings County	12-23-19	1,450	cleaning out
Associates Pet., No. 1 Lewis Creek, San Benito Co.	5-19-10	450	sd. drilling

IMPORTANT SOUTHERN CALIFORNIA WILDCATS

Ring Pet. Co., No. 1 Inglewood, Los Angeles County	28- 2-14	5,487	suspended
Ohio Oil Co., No. 1 Playa Del Rey, Los Angeles County	22- 2-15	3,820	hd. sd. drilling
Petroleum Securities, No. 1 Hermosa, Los Angeles Co.	32- 3-14	4,140	br. sh. drilling
Western Drlg. Co., No. 1 Manhattan, Los Angeles Co.	30- 3-14	4,900	sd. sh. drilling
Standard, No. 1 Hawthorne, Los Angeles County	5- 3-14	1,529	sd. sh. drilling
Circle Oil Co., No. 1 Gardena, Los Angeles County	23- 3-14	4,280	resume work
Allied Pet., No. 1 Redondo, Los Angeles County	28- 3-14	918	sd. drilling
Mont. Park Pet. Co., No. 1 Jepson, Monterey Park	25- 1-12	3,937	suspended
Rio Grande, No. 1 Downey, Los Angeles County	34- 2-12	5,149	abandoned
Jackson, R. W., No. 1 Whittier, Los Angeles County	19- 2-11	753	hd. sd. drilling
Burlington Pet. Co., No. 1 Compton, Los Angeles Co.	17- 3-13	629	sd. drilling
Easton & Smith, No. 1 Calabasas, Los Angeles Co.	19- 1-17	2,982	suspended
Pugh Miller Drlg. Co., No. 1 Calabasas, Los Angeles	6- 1-17	1,217	br. sh. drilling
Russell Oil Co., No. 2 Joughin, Los Angeles County	25- 3-17	1,620	br. sh. drilling
Pomona Oil Co., Well No. 1, Los Angeles County	32- 1- 8	1,106	hd. sd. drilling
Anchor Oil Co., No. 1 Puente, Los Angeles County	19- 2-10	4,820	suspended
Richfield Oil Co., No. 1 Puente, Los Angeles County	9- 2-10	4,390	sd. sh. drilling
Shell, No. 1 Coyote, Los Angeles County	28- 3-10	....	location
Union Oil Co., No. 1 Richfield, Los Angeles County	13- 3- 9	rig	rigging up
Western Drlg. Co., No. 1 Richfield, Los Angeles Co.	21- 3- 9	2,640	sd. sh. drilling
Anderson, P. B., No. 1 Hasley Canyon, Los Angeles Co.	1- 3- 16	rig	rigging up
Fico Dome, No. 1 Hasley Canyon, Los Angeles County	14- 3-16	306	sd. drilling
Calif. Eastern, No. 1 Wickham, Los Angeles County	32- 5-17	3,517	suspended
Coastline Oil Co., No. 1 Devil Canyon, Los Angeles Co.	21- 5-17	514	cleaning out
Mesa Pet., No. 1 Newport, Orange County	21- 6-10	4,002	gr. sd. drilling
West. Drlg. & Prod. Co., No. 1 Newport, Orange Co.	18- 6-10	4,461	suspended
West. Drlg. & Prod. Co., No. 2 Newport, Orange Co.	18- 6-10	2,071	sd. sh. drilling
Travis Drlg. Co., No. 1 Buena Park, Orange County	36- 3-11	rig	rigging up
Hall Pet. Co., No. 1 Murrietta, Riverside County	23- 7- 3	975	cleaning out
Hemet Pet. Co., No. 1 Ward, Riverside County	9- 5- 1	3,232	suspended
Imperial Valley Oil Co., Well No. 1, Imperial County	32-11-10	2,720	sd. sh. drilling
Davenport Oil & Gas Co., No. 1 San Marcos, San Diego	30-12- 8	847	suspended
Turner, S. S., No. 1 Escondido, San Diego County	25-12- 2	1,857	bl. sd. drilling

YEARS *the* LEADER



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BRANCH STORES
IN ALL OIL FIELDS

Bulk of New Wells in Central Ohio

Illinois Did Not Have Single Completion and Indiana Wildcat Was Abandoned as Dry Hole at 2,191 Feet

By Whit
Staff Correspondent, Central West Fields

FINDLAY, Ohio, Apr. 22.—Illinois was the only division of the Central West Field not reporting a completion, the bulk of the new wells coming from the Central Ohio area.

In the old Lima Field of northwestern Ohio an unusually good well has been added to Wood County, where Glass and Shellenberger's test, 400 feet from the south line and 1,200 feet from the east line of the Harry Brandeberry farm, on the oil map as the Reuben Hardinger, in the NE Section 32, Perry Township, and south of Fostoria, produced an initial of 50 bbls. at a total depth of 1,340 feet, or 40 feet in the Trenton formation. In Lake Township, same county, Lantz, Schulte and others' test, 800 feet from south line and 200 feet from the west line of the Simon Acherberger farm, in the NE Section 32, pumped 5 bbls., and is some distance away from former production. Sand was tapped at 1,272 feet and drilled 50 feet in the sand.

In Eagle Township, Hancock County, R. T. Rittenhouse's No. 7 well, 200 feet from the south line and 1,000 feet from the west line of the Frank Freed farm, in the NW Section 6, pumped 25 bbls. Sand was topped at 1,314 feet and drilled 75 feet in to a total depth of 1,389 feet.

Northeast of Lima, in Bath Township, Allen County, J. W. Davis drilled a test in the northeast corner of the Milo Roberts farm, in the NE Section 16, getting a duster at a depth of 1,320 feet, or 25 feet in the sand where a heavy dose of salt water was encountered and only a scum of oil.

INDIANA

The only completion for the week in the Indiana fields was a wildcat drilled by Fletcher, Mosier and others, 500 feet from the north line and 330 feet from the east line of the B. A. Rose farm, better known as the Goose Pond farm, in the NE SE, Section 3, Stockton Township, Greene County, in the western part of the State. The well was drilled to a total depth of 2,191 feet and given up as a dry hole.

Unknown parties drilling on the Walters farm, near Gentryville, in Spencer County, in the southern part of the State, had the well shot but it is not yet tested for its value as a producer, although it looks very encouraging. The shot was made by the Kentucky Glycerine Co.

The Ohio Oil Co. abandoned its No. 1 on the Rufus Morgan's No. 2 farm, in the SE Section 26, Madison Township, Pike County.

CENTRAL OHIO

Twenty completions were reported from the Central Ohio fields during the week, of which four were producers with an initial of 255 bbls., 5 dry holes and 11 gas wells, while in new work starting, 14 new locations were made and 20 new wells started spudding, a total in new work of 34, which indicates there is no let up in development work, especially by the large gas operating concerns.

The banner producer of oil was found in Ashland County, by Robinson and others in a second test on the Emma Devinney farm. Section 9, Lake Township, which produced at the rate of 10 bbls. an hour and was reported around 200 bbls. initial, making it the best completion in this county for a long period. In Greene Township, the Ohio Fuel Gas Co.'s No. 1-3,444, Bertha M. Peters farm, Section 26, is credited with being good for 4 bbls. Same company made location on the J. H. Van Horn farm, Section 33, and the Logan Gas Co. has started drilling No. 1-3,072 on the M. and L. Wittsmier, Section 20. In Orange Township, the Ohio Fuel Gas Co. is drilling No. 1-3,474 on the Royal J. Welch, Section 12, and made a location for No. 1-3,518, Peter Miller farm, Section 25. The Logan Gas Co. made a location for No. 2-3,097, C. P. Miller, Section 14, and also for No. 3-3,095, Iva Benner, Section 18. In Lake Township, Robinson and others are drilling on the John Cable, Section 9. In Perry Township, Robinson and others' second test on the L. H. Smalley, Section 4, is reported good for 5 bbls. In Mohican Township, O. W. Zink and others have a light gas well on the Mrs. James Chesrown, Section 32, and W. J. Smith is drilling No. 4 Guy Humm, Section 29. In Jackson Township, the Ohio Fuel Gas Co. is drilling No. 1-3,462, A. L. Reed, Section 26.

In Medina County, Medina Township, The Ohio Fuel Gas Co. made a location for No. 1-3,519, Adam Leister, Section 8, and staked out No. 2-3,517, Mary Towslee, Lot 57, Harris Township. Same company is drilling No. 2-3,502 on the J. J. Winkler, Section 5, Guilford Township.

In Lorain County, the Chemical Oil & Gas Co. found a dry hole in a second test on the John T. April, Lot 92, Grafton Township. In Lagrange Township, the Ohio Fuel Gas Co.'s No. 1-3,446, Wesley Tran, Lot 13, failed to find any sand and is dry. Same company made a location for No. 3 on the F. L. Nobles, Lot 1, Eaton Township. Logan Gas Co, made a location for No. 2-3,096, James Malik, Lots 18 and 19, Carlyle Township.

In Wayne County, the Ohio Fuel Gas Co.'s No. 1 C. F. Myers, Section 7, Congress Township, is a fairly good gas producer. Barnhart and others are drilling on the Jennie Keim, Section 5, same township.

In Richland County, Monroe Township, Ohio Fuel Gas Co. made a location for a second well on the Charles G. Schrack, Section 28.

Coshocton County

In Coshocton County, Clark Township, the Logan Gas Co.'s No. 1-3,070 on the Victor Shiebe, Lot 1, is credited with an initial of 36 bbls. Clark Oil Co. is drilling No. 9 Jesse B. Lawrence, Section 5, same township. Ohio Oil Co. is drilling No. 2 Frank Mullett and made a location for No. 2 Robert Rhode, same township.

In Licking County, Fallsburg Township, the Emerald Petroleum Co. is drilling No. 3 John A. Little, Section 8. In Perry Township, the Settles Oil Co. is drilling No. 1 Nellie Smith, Section 17, and the Preston Oil Co. is drilling No. 4 Ollie Lear, Section 15. Hope Construction & Refining Co. made a location for No. 3 Charles Obannon, Section 16, Hanover Township.

In Muskingum County, Perry Township, the Mid-East Oil Co.'s No. 2 William Knight, Section 15, is reported a dry hole not being good enough to put on the pump, as the showing of oil was small. Top of the Clinton lime was found at 3,964 feet; first show of gas at 3,975 feet; first oil showing at 3,980 feet; second gas showing at 3,985 feet; second oil showing at 3,992 feet; bottom of Clinton at 3,995 feet, total depth 4,005 feet. In Washington Township, the Bateman Oil Co.'s test on the Mary A. Bateman heirs, Section 7, developed into a duster. Clinton lime in this well found sand from 3,950 to 3,985 feet and top of Medina formation at 4,021 feet. In Hopewell Township, the Hope Construction & Refining Co. is drilling No. 4 Joseph Varner, Section 5. In Muskingum Township, the Preston Oil Co. is drilling No. 1-1,295 on the P. D. Adams, Section 13. In Jackson Township, the Hope Construction & Refining Co. is drilling No. 6 W. E. Helphrey, Section 6. In Falls Township, the Athey Drilling Co. made a location on the Ida B. McLaughlin farm, and is drilling on the Henry Hockmeister, Section 5.

In Athens County, Ames Township, the Ohio Fuel Gas Co.'s No. 1-3,428 Euriah Brooks, Section 3, is a very fair gas well in the lower Berea sand at 1,512-28 feet; total depth 1,537 feet. Same company made a location for No. 2-3,513 same farm. Kiggins and others have a very light gas well in No. 4 on the O. B. Jones, Section 3. In Dover Township, the Logan Gas Co. is drilling No. 72-3-080 on the Sunday Creek Coal Co.'s land, Section 29. In Berne Township, the Ohio Fuel Gas Co. found a nice gas producer at No. 4-3,475, E. C. Glass, Section 30, in the lower Berea at 1,341-61 feet, total depth 1,367 feet. In Carthage Township, the Logan Gas Co. is drilling No. 1-3,088 N. E. Kincade, Section 32. In Lodi Township, the Ohio Fuel Gas Co.'s No. 2-3,464, W. A. Swartz, Section 1, is a dry hole in the upper Berea at 1,580-1,600 feet, total depth 1,675 feet. In Troy Township, the Ohio Fuel Gas Co. has an average gas well in No. 1-3,373 on the H. K. Winters, Section 34. The gas was found in a stray sand at 1,000-10 feet.

In Meigs County, Sutton Township, Simon Lebow is drilling a second test on the Raymond Krauter, Section 20, and Tyree and others are drilling No. 7, William Carnahan, Section 11. Logan Gas Co. made a location for No. 1-3,092 on the John Heidter, Section 32, Bedford Township. In Salisbury Township, W. H. Sipe and others have a very light gas well in No. 1 Dollie M. Diehl, Section 23, in the shale at a depth of 568 feet. Ohio Fuel Gas Co. made a location for No. 1-3,510 on the Alantson Archer, Section 35.

Jackson County

In Jackson County, Milton Township, the Ohio Fuel Gas Co. has a good gas well in No. 1-3,417 on the James C. Washburn, Section 18, in the Clinton sand, 2,683-99 feet, total depth 2,701 feet. In Lick Township, the Ohio Fuel Gas Co. No. 1-3,262 on the Sabine Jenkins, Section 23, is a fairly good gas well in the Clinton at 2,661-76 feet, total depth 2,678 feet. Same company's No. 1-3,36[illegible] on the L. T. Rice, Section 13, is a very light showing of gas in the Clinton at 2,694-2,707 feet, total depth 2,711 feet. Same company is drilling No. 2-3,48[illegible] Z. L. Dearing, Section 28, Franklin Township, and No. 2-3,323 on the Jan Cox, Section 11, Washington Township.

In Gallia County, Addison Township, Halstead and Kenney have a light gas well in No. 1 Johnie Brothers, Section 15, in the lower Berea at 1,558-89 feet, total depth 1,599 feet.

In Lawrence County, Elizabeth Township, the Southern Ohio Gas & Fuel Co. is drilling on the Hanging Rock Iron Co. land, Section 30.

In Guernsey County, Wheeling Township, the Logan Gas Co. has abandoned the location for No. 2-281 on the W. T. Booth, Section 10, and moved off the derrick. J. T. Watson and others are drilling on the Robert C. McMurray, Section 19.

In Morgan County, Marion Township, J. H. McBride has an average gas well at a second test on the Marion Mill

(Continued on Page 181)

DAVIESS COUNTY LED OHIO COUNTY IN WESTERN KENTUCKY OPERATIONS

By Whit

OWENSBORO, Ky., Apr. 22.—Daviess County made a much better showing for the week than did the Ohio County area and while there was but one well less completed in Ohio County, the production of Daviess County wells was more than three times as much. The best completion in Daviess County was a well on the Leet lease with an initial of 120 bbls., and the largest in the Harftord area of Ohio County was a 50-bbl. initial producer on the Tom Howard lease. This well opens up a wide area and many locations are being made and new wells drilling around it.

With better settled weather there will be a rush of work in all parts of the western part of the State, as operators are anxious to get busy testing out some of their holdings.

Pipe Line Runs

According to reports there were 402,667.10 bbls. of crude handled during March through the pipe lines that make their monthly reports. In the eastern part of Kentucky, the Cumberland Pipe Line Co.'s runs for March totaled 188,917.24 bbls.

In the western division the Illinois Pipe Line Co.'s runs from western Kentucky for March were 192,270.84 bbls. The Paragon Development Co.'s runs for the same period totaled 14,756.25, of which 13,706.94 bbls. were from Barren County and 1,049.31 bbls. from Cumberland, Monroe and Clinton Counties, while the same company handled through its lines 321.76 bbls. from Clay County, Tennessee. Stoll Oil Refining Co. handled through its gathering lines in Barren County a total of 6,722.77 bbls. during March. The Producers Pipe Line Co. in the Tri-County Field of Ohio, Hancock and Daviess Counties, does not make any report of runs for publication.

Week's Work

A summary of the week's work in Kentucky shows 24 completions, 20 producers with an initial production of 638 bbls., 4 dry holes and no gas wells.

County—	Comp.	Oil wells	Prod.	Dry
Daviess	11	9	509	2
Ohio	10	10	128	0
Warren	1	1	1	0
Allen	1	0	0	1
Hancock	1	0	0	1
Total	24	20	638	4

Daviess County Wells

The most closely watched wildcat drilled in any part of the western Kentucky Field was that of the Creek Drilling Co., on the Hamilton farm, to the west of St. Joseph, in the extreme western part of the county, which was drilled around 2,000 feet and pronounced a dry hole and abandoned. Its location was between the Soroho fault zone and the Curdsville fault zone.

Whitmer Oil & Gas Co. drilled a dry hole on the T. T. Martin farm, 1½ miles south of Utica.

Creek Drilling Co.'s No. 5 on the J. F. Leet 66 acres, in the Brown Pool, showed an initial of 120 bbls., and the same company's No. 3 Jim Brown farm, same pool, procured an initial of 14 bbls.

The Petroleum Co.'s No. 12 Everette Burns farm, in the Utica area, produced an initial of 90 bbls., while No. 13, same farm, produced 45 bbls. Same company's

(Continued on Page 181)

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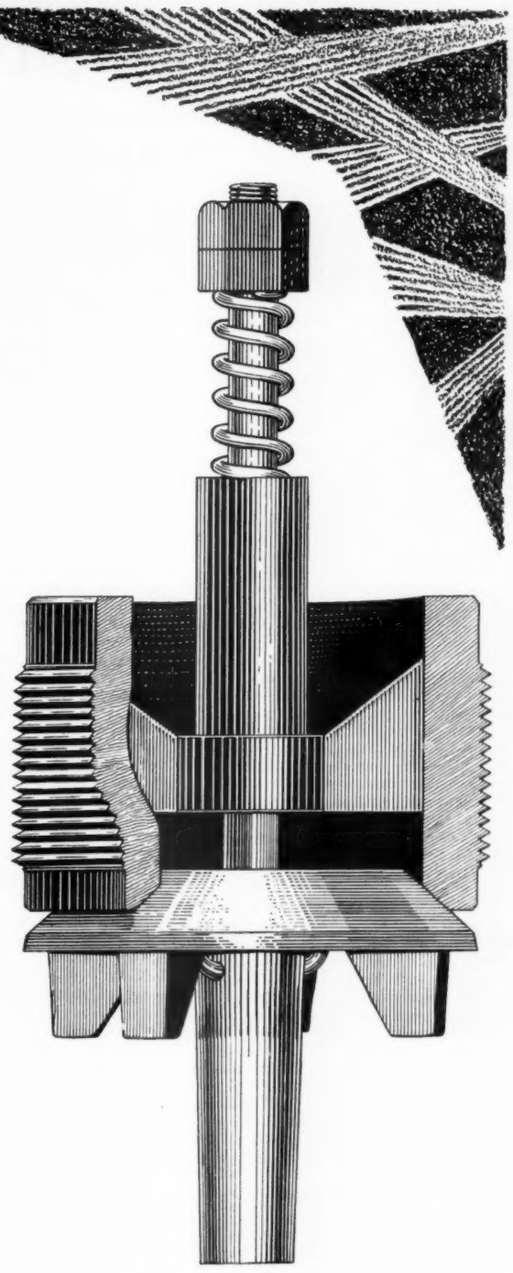

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View of the complete assembly ready for insertion between the tool joints.

New Work Starting in Eastern Fields

Wildcatters To Make Renewed Effort. Wayne County, West Virginia, to Get First Play. Ravenwood Disappoints

By D. S. Wakenight
Staff Correspondent, Eastern Fields

PITTSBURGH, Pa., Apr. 22.—There were a few better than average completions, nearly all in Southeast Ohio. Rain put the roads in West Virginia and Southeast Ohio in deplorable condition, making it next to impossible to move drilling material in many places.

In some sections of the eastern fields there is considerable new work starting and by the summer months will be a revival of operations. The wildcatters will make a determined effort to find new producing territory, despite the fact so much has been done without revealing new pools. Wayne County, West Virginia, will be the first. Some small wells have been completed in that county but the lack of pipe lines has been a hindrance. In the near future the Eureka Pipe Line Co. will lay 12 miles of 2 and 3-inch line into that county and its completion will be an incentive for testing out the county more thoroughly. For some years the Chartiers Oil Co. has been drilling in that county and has nearly all of the new production, claimed to be about 40 bbls. a day.

The prospect for a pool of considerable size in Ravenwood district, Jackson County, has been somewhat dissipated in the past few weeks. The late completions have come in light pumpers. No other of the counties in West Virginia look promising for the wildcat operator at present. Operators will continue to drill in the old fields where there is still room for additional wells. The gas companies are still active in Lincoln and Calhoun Counties.

Drilling deeper and shooting old wells is still a feature. By this method a little more new production can be obtained. Market conditions remained unchanged during the week. The refineries are taking all of the Pennsylvania grade offered and a shortage is anticipated in the near future. The demand for gasoline and lubricants promises to be greater than any previous year.

SOUTHEAST OHIO

The few completions better than the average follow: In the SW of Section 12, Reading Township, Perry County, the Preston Oil Co. completed and shot in the Clinton sand No. 3 on the Tennyson Christ farm. It produced 45 bbls. the first 24 hours.

In Lot 10, Clark Township, Coshocton County, the Logan Gas Co. completed in the Clinton sand a test on the Victor Scheibe farm. It produced 35 bbls. the first 24 hours. In the NE of Section 22, York Township, Morgan County, the Hopewell Fuel & Gas Co. completed and shot in the Clinton sand a test on the B. F. Tharp farm. It produced 80 bbls. the first 24 hours.

Deep Sand Territory

In the deep sand territory in Southeast Ohio, in the SW of Section 5, Jackson Township, Perry County, Perry Sturm and others have completed a light pumper in the Clinton sand on the Margaret M. Griggs farm.

In Section 36, Clinton Township, Monroe County, F. H. Ward and others have completed in the Keener sand No. 3 on the F. H. Ward farm, a duster. In Section 3, Bethel Township, the Ohio Fuel Gas Co. has a good gasser at a second test on the E. R. Blair farm. It is also spraying considerable oil.

In Section 6, Pike Township, Perry County, the Yu-La-Kan Oil Co. and others are due in the Clinton sand on the R. E. Bennett farm. In Section 21, Harrison Township, R. C. Miller & Co. after a fruitless fishing job at a second test on the Lewis Hughes farm have skidded the rig and started a new hole. In the same township, Ralph Brothers, Inc., have a rig up on the M. T. and F. C. Moore farm.

In Section 5, Salt Creek Township, Holmes County, the Ohio Fuel Gas Co. has a rig completed on the H. D. Gilgoe farm. In Section 7, Cambridge Township, Guernsey County, George J. Will and others have a rig up on the J. T. Moore farm. In Wheeling Township, the East Ohio Gas Co. is drilling on the Wilber Wilson farm.

In Section 4, Licking Township, Muskingum County, the Hope Construction & Refining Co. has a 10-bbl. pumper at No. 4 on the Almeda Butler farm. In Vinton Township, Vinton County, Townsend and others have a very light pumper at a second test on the Edward Quick farm.

In the NW of Section 6, Jackson Township, Muskingum County, Ohio, the Pure Oil Co. has completed a test on the Otis McKee farm. The well produced 65 bbls. the first 24 hours after shot in the Clinton sand.

In Section 9, Perry Township, Licking County, M. F. Whitehill completed and shot in the Berea grit his No. 8 on the Alice Ashcraft farm. It produced 12 bbls. the first 24 hours. In the SW of Section 13, Washington Township, Hocking County, the Rauber Oil Co. completed and shot in the Clinton sand No. 5 on the Emily Thrush farm. It is a 10-bbl. pumper.

In the SE of Section 13, Pike Township, Coshocton County, the Leonard Oil & Gas Co.'s test on the Hattie Russell farm is a 12-bbl. pumper in the Clinton sand. In Section 22, Washington Township, Hocking County, the Preston Oil Co.'s second test on the Henry Rhenscheld farm produced 17 bbls. after completed and shot in the Clinton sand.

Vinton and Meigs Counties

At Bollin Mills, Section 3, Knox Township, Vinton County, the Co-operative Oil Co. has completed a second test on the Garfield Brooks farm. It is a 6-bbl. pumper in the Berea grit. In Section 11, Sutton Township, Meigs County, the Twenty-Five Association, Inc., completed in the Cow Run sand No. 7 on the William Carnahan farm, good for 15 bbls. a day. In the same township, L. Lewbow has started to drill a second test on the Elizabeth Kreanter farm.

In Section 8, Spencer Township, Guernsey County, J. A. Patton and others have a duster in the Niagara lime on the Marshall heirs' farm. In Jackson Township, the Preston Oil Co. has a rig up on the Charles Wiggington farm. In Section 8, Trimble Township, Athens County, the Palor Oil & Gas Co. is drilling on the George W. McDonald heirs' farm.

The Clinton sand territory in Muskingum County has five wells due in the sand and Wilson Brothers have a rig completed on their own farm. In Fallsbury Township, Licking County, the Preston Oil Co.'s No. 6 on the Wayland Ashcraft farm is a very light pumper in the Clinton sand. In the same locality the Penn-Ohio Gas Co. is due in the Clinton sand at a second test on the Helen Young farm. In Perry Township the Hope Construction & Refining Co. has the rig completed for a second test on the Rector heirs' farm.

In the NW of Section 19, Harrison Township, Perry County, the Ohio Fuel Gas Co. completed in the Clinton sand on the May-Watts farm, a gasser good for 1,000,000 feet. In Section 30, Jackson Township, the Hub Oil Co. has a 20-bbl. producer in the same formation on the Mary Larimer farm.

In Rush Creek Township, Fairfield County, the Hope Construction & Refining Co. is drilling to the Trenton Rock on the S. W. Black farm. It is now down 4,200 feet. In Section 5, Harrison Township, the Ohio Fuel Gas Co. has a rig up on the Mrs. Charles Bownar farm.

In Section 30, Ward Township, Hocking County, A. H. Squires and others are drilling on the Cobb-Bradley farm. In the same township the Northern Development Co. has the rig completed on the J. G. Payne farm. In Washington Township the Preston Oil Co. has the rig completed for a second test on the Martin Huggins farm. In Clarke Township, Coshocton County, the Ohio Oil Co. has the rig completed for a second test on the F. J. Mullet farm.

Holmes and Guernsey Counties

In Section 14, Richland Township, Holmes County, the East Ohio Gas Co. has completed in the Clinton sand on the G. O. Ledbetter farm, a gasser good for 1,000,000 feet. In the SW of Section 15, Jackson Township, Guernsey County, the Preston Oil Co. has completed No. 3 on the Charles Wiggington farm. It is a duster.

WEST VIRGINIA

In DeKalb district, Gilmer County, the South Penn Oil Co. completed in the Maxon Sand No. 4 on the R. F. Ellis farm. It produced 40 bbls. the first 24 hours.

In Sheridan district, Calhoun County, the Daily Oil & Gas Co.'s test on the Robert Maze farm is a gasser in the Maxon sand. In Jefferson district, Lincoln County, the United Fuel Gas Co. has a gasser in the Berea grit at its No. 2,557 on the Goose Creek Land & Mining Co. property. In Washington district, Boone County, the Owens Bottle & Machine Co. has a light gasser on the B. S. Ballard farm. In the same district, the same company has a light gasser on the Isiah Nelson farm.

In Scott district, Boone County, the Hope Natural Gas Co. has a light gasser in the Big Injun sand at No. 7,227 on the F. B. Chambers farm. In Sherman district, the Pure Oil Co.'s No. 35 on the Lafollette, Robson & Prichard tract B is a 5-bbl. pumper in the Berea grit. The same company is drilling Nos. 30 and 36 on the same tract. The same company is drilling three wells on the Federal Coal Co.'s property. In Logan district, Logan County, the Clendenin Gas Co. is drilling two tests on the Boone County Gas Corp.'s property.

On the Kanawha River, Sheridan district, Kanawha County, the Daily Oil Co. has completed a test on the Robert Maze farm. It is a gasser in the Big Injun sand good for 500,000 feet. The location is 1,400 feet northeast of the Hope Construction & Refining Co.'s test on the T. M. Marshall farm. On the same river in Center district, same county, W. H. Bickel has completed in the same formation No. 6 on the Bell heirs' farm. It is also good for 500,000 feet.

Starting and Drilling

In Williams district, Wood County, Rinehart & Crocker have made a location on the C. H. Athey farm. In the same district, Lott, Stephens & Co. have made a location on Mary M. Fair farm. In Union district, Strain Brothers are due in the sand on the B. C. Strain farm. In Clay district, Marion County, the Chartiers Oil Co. has made a location on the J. Killberry farm. In PawPaw district, same county, the Owens Bottle & Machine Co. has started to drill on the Minnie Weston farm. In McClellan district, Doddridge County, J. W. Johnson is rigging up on the Salina Craig farm. In Liberty district, Marshall County, the Manufacturers Light & Heat Co. is building the rig for a second test on the William Meighan farm.

Putnam and Lincoln Counties

In Curry district, Putnam County, the Sovereign Gas Co. has a gasser in the Berea grit at a second test on the Switz heirs' farm. In Duval district, Lincoln County, the United Fuel Gas Co.'s No. 2,517 on the Horse Creek Land & Mining Co.'s tract is a gasser in the sand formation. In Jefferson district, Earl Cameron has a gasser in the same formation at No. 3 on the J. A. Stone farm. In Scott district, Boone County, Earl Cameron's test on the W. L. Stone farm is a gasser in the same formation.

Calhoun County

In Center district, Calhoun County, B. Lewis & Co. have started to drill on the Roach Hall farm. In the same district, the Sycamore Fuel Co. has started to drill on the Hardman-Stalnaker farm. In Lee district, the Calhoun Oil & Gas Co. is building a rig on the L. C. Garrett farm. In Geary district, Roane County, the United Fuel Gas Co. has started to drill on the G. D. Wilmoth farm. In the same county, the same company has made locations for six wells. In Reedy district, Law & Co. have a rig completed on the R. E. Tennant farm. In Sherman district, Calhoun County, the Hope Natural Gas Co. has five wells drilling and two rigs up.

In Mannington district, Marion County, Monroe & Laughlin are drilling on top of the Gordon sand on the W. S. Morris farm. In Duval district, Lincoln County, the Downing Gas Co. has started to drill on the Davis heirs' farm. In Jefferson district, Earl Cameron has started to drill on the Golden Stone farm.

On Lee Creek, Elizabeth district, Wirt County, Porter Abbott has the rig completed on the Alonzo Daniels farm. In the same district, on Reedy Creek, Harry O'Neil, Athey and others have started to drill on the J. A. and Carrie Rathbone farm. In McKim district, Pleasants County, Charles Hastings and others have started to drill on the Sol Robinson farm. In DeKalb district, Gilmer County, the McCall Drilling Co. has started to drill deeper its second test on the Riddle Brothers farm.

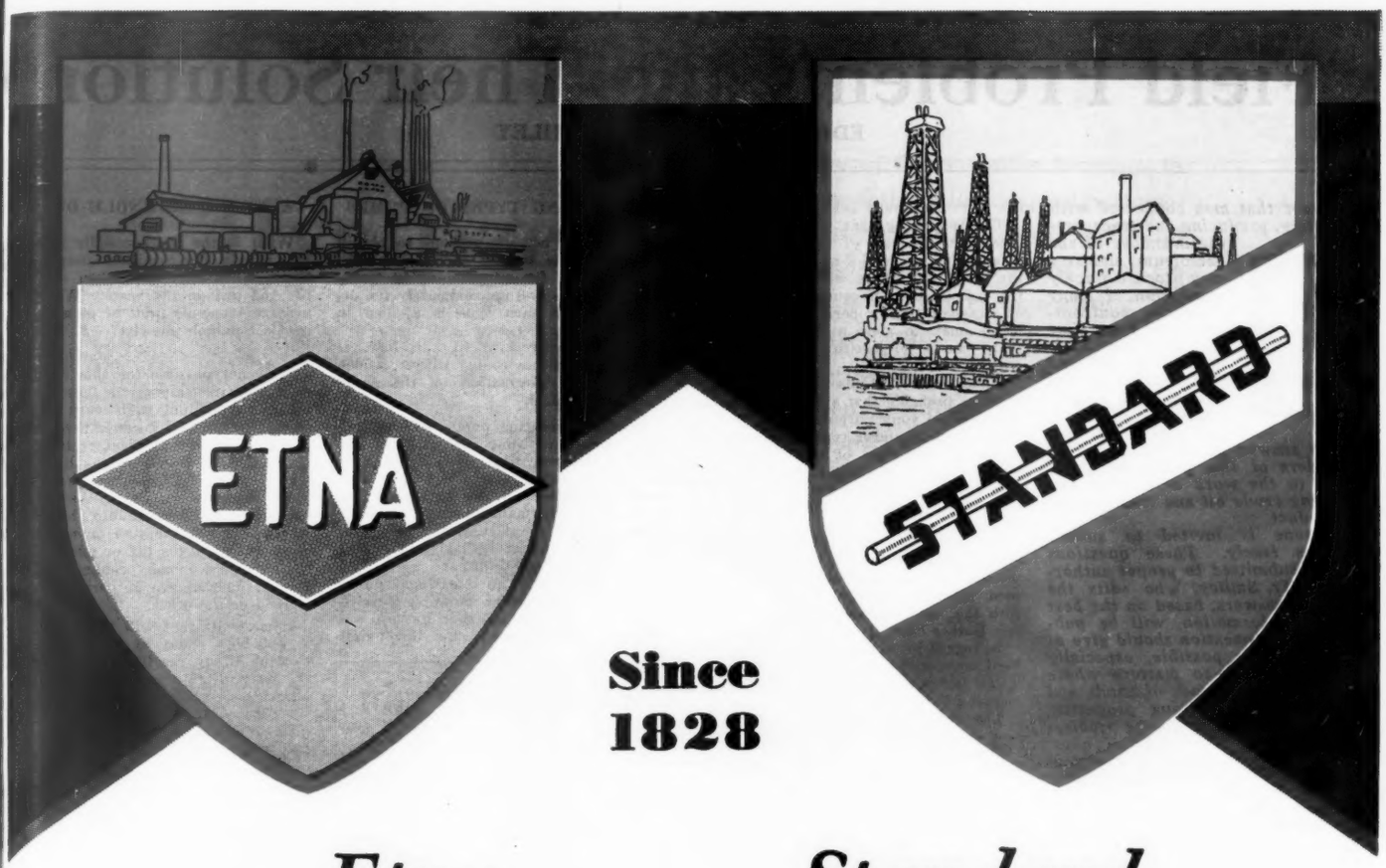
Harrison County

On Salem fork, Ten Mile district, Harrison County, the Salem Concrete Co. has completed on the Tilden Williams farm a light gas well in the Fifth sand showing a little oil in the Gordon sand. On Flinderation Run, same district and county, Burke & Dennison have completed in the Gordon sand a light gas well on the J. R. Dennison farm.

On Plum Run, Murphy district, Ritchie County, Weinrick & Snyder have a rig up on the Zack Weinrick farm. On Hughes River, same district, the R. & R. Oil Co. has a rig completed on the J. B. Rogers farm. On Robioson Run, McClellan district, Doddridge County, W. Johnson & Sons have a rig up on the Craig-Dudley farm.

In Sherman district, Calhoun County, McIntosh & Miller have a rig up on the E. E. Miles farm. In McComas district, Cabell County, the Hamilton Gas Co. has started to drill on the Robert E. Childers farm. In the same district, W. C. Mc Corkle is building a rig on the Day Co farm. In Scott district, Boone County, the United Fuel Gas Co. has started to drill on the Pearl Stollings farm. In Chapmanville district, Logan County, the Hope Natural Gas Co. has started to drill on the Frank Barker farm. In Carroll and Jefferson districts, Lincoln County, the United Fuel Gas Co. is drilling an

(Continued on Page 121)



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Field Problems and Their Solution

EDITED BY THOMAS F. SMILEY

In order that men connected with the drilling, producing and transporting branches of the petroleum industry may procure quickly a solution of many problems confronting them from time to time in their work, The Oil and Gas Journal has arranged with leading engineers and other recognized authorities to answer questions submitted by readers of this publication pertaining to the work of drilling and producing crude oil and transporting this product.

Everyone is invited to submit questions freely. These questions will be submitted to proper authorities by Mr. Smiley, who edits the page, and answers, based on the best available information, will be published. Each question should give as much detail as possible, especially where it relates to matters where depths of sands, types of sands and operations on adjoining properties would have a bearing on the problem involved. The source of all questions will be considered as confidential and only initials will be published in connection with the question.

In this connection, The Oil and Gas Journal will be glad to publish articles from field men who have devised new methods or practices which are improvements.

In case an immediate answer is important, one will be given by mail if the writer requests it.

SOME PRODUCTION QUESTIONS

What should be the approximate cost of pumping a 650-foot well making about 6 to 10 bbls. of 17.5 gravity high lubricating content crude along with about 15 bbls. of water and considerable fine sand?

What general type of working barrel would you advise using? I have had considerable trouble getting hard composition cups to seat properly and although leather cups work fine, they last only a few hours. The barrel also wears quite fast, but otherwise chemical corrosion is absolutely negligible.

What would be the smallest size sucker rods which would be economical and serviceable? What stroke and frequency would you advise? I wish to pump 24 hours since production falls off rapidly if the well stands over an hour.

On each well I am using a 5-horsepower motor driving a jack making twelve 12-inch strokes per minute. The current amounts to about $30 a month per well.

Do you think these wells can be made to pay with a market at $1.75 to $2.25 per barrel? When allowed to stand idle a week or more, these holes fill with water and then seep oil continuously at the rate of several ounces per day.

Also, I would be greatly obliged to you if you can tell me what field produces crude similar to Callihan, that is about 20 per cent gas oil, 60 per cent lub distillate, and 18 per cent asphalt. The crude is a beautiful green, has a rather pleasant odor and contains no wax. It is absolutely non-corrosive. The gravity is 18.—G. W. S.

From the information that you have submitted it is not possible for this department to answer all of your questions. For instance, the lift costs on any property must depend upon the local conditions such as the size of the property, the number of wells, capacity of wells, type and condition of equipment, the items to be included in calculating the lift costs and many other factors.

The best thing that you can do is to obtain an analysis of the lift costs on neighboring properties and compare their lift costs with yours when calculated on the same basis. Of course, the lift costs on any operating property should be made low enough to yield a profit, otherwise there can be no justification for the operation.

Under the conditions that you describe it seems probable that a fluid pack pump would serve your purposes best. One of the multiple chamber types of barrels designed to take care of sand might also be what you need. For further information regarding these pumps, consult the advertising columns of The Oil and Gas Journal.

Ordinarily in wells 650 feet deep a common working barrel will give satisfactory service. When using such barrels it is good practice to equip the pump with both the hard composition cups and the soft leather cups arranged alternately.

In regard to your trouble in getting the hard composition cups to seat properly, it is impossible to help you without knowing what kind of pump you use.

The smallest standard sucker rod made now is of five-eighths inch diameter.

The frequency and length of stroke are governed by your particular requirements and must be adapted to these requirements. If you wish to pump 24 hours a day, you should adjust the frequency and length of stroke to suit that requirement, and avoid pumping the wells off. Knowing the volume to be pumped per day and the volumetric efficiency of the particular pump in use, you can make some preliminary calculations to determine about the number of strokes per minute required for a certain length of stroke. The rest of the problem must be solved by actual field operations and the results obtained.

In regard to your pumping costs and whether or not you can make a profit from oil selling at $1.75 to $2.25 per barrel, it would appear as if your individual well power costs are much higher than would be the case if you had a central power. A central power should cut down your power costs if the property, the number of wells, and the situation of the wells are adapted to the use of a central power. In Osage County, Oklahoma, and in neighboring districts, many wells making less than 1 bbl. of oil per day are being pumped on central powers.

You evidently have a serious water situation which makes it necessary to pump your wells continuously. This should be corrected immediately if it is possible to do so. You should try to determine the source of the water and then shut it off. If you cannot shut off the water it seems probable that your property is in grave danger of being ruined either by being drowned out by water or by becoming unprofitable to operate because of the high cost of keeping the wells dewatered.

In regard to localities producing oils similar to yours, you are referred to the crude oil surveys of the United States by the United State Bureau of Mines. An inquiry addressed to the United States Bureau of Mines, Washington, D. C., should bring you the desired information.

POSITION OF WALKING BEAM

Can you tell me any purpose or any advantage gained by placing a walking beam unsymmetrically on the samson post so that the pitman end of the beam is the longest?—S. S. T.

One reason for this arrangement is to make the beam drop out of the way when the clamps are removed during drilling operations. Another purpose is to increase the leverage in either drilling or pumping operations.

CONCERNING TYPES OF PUMPS

The writer is very anxious to obtain information as to the types of pumps that are used for oil pumping in transportation lines and approximately the degree to which each type is applied in this particular service.

I would appreciate it, therefore, if you could indicate to me where to look for the best information on the above matter.—T. M. J.

Both reciprocating pumps and centrifugal pumps are being used in pipe line service. Reciprocating plunger pumps of the duplex and triplex types have been used most extensively for both gathering systems and permanent trunk line stations. During the last two years, however, centrifugal pumps have come into wide use on Mid-Continent and West Texas pipe lines. The centrifugal pump, used first for booster pumping service, proved so satisfactory that its use was extended to permanent main line pumping units on some trunk lines out of West Texas.

In such installations in Oklahoma it is customary to use two 4-stage centrifugal pumps in series, each being driven at about 3,100 revolutions per minute by a separate 300-horsepower motor. One of these plants pumps 52,000 bbls. of oil a day against a pressure of 700 pounds. The first cost of the centrifugal units is less than that of plunger pumps, but they require electrical power and suffer cutting from sand suspended in the oil. The plunger pumps can be operated by gas or Diesel engines.

Certain limitations in the availability of the centrifugal pump in pipe line service are recognized and its use in this field has not been of such duration as to prove its efficiency under prolonged service. It seems to have been demonstrated, however, that this type of pump is to have an important place in oil transportation.

You will find a wealth of information along the line of your inquiry in The Oil and Gas Journal for August 30, 1928, (Pipe Line number). Especially recommended for your reading are "The Trend of Oil Pipe Line Practice," "Gas Engines Important in Pipe Lines," "Centrifugal Pumps for Pipe Line Use," "Air Chambers for Reciprocating Pumps," "Use of Electric Pumps on Pipe Lines," and "Big Development in Centrifugal Pumps."

WHY IS IT CALLED THAT?

FLOWING PLANT

The term "flowing plant," which rapidly has been coming into general use, grew out of the need for a simple designation to take the place of a cumbersome one. From the fact that either air or gas can be used as the medium for flowing a well the expressions "gas-air lift" and "air or gas lift" were employed. They were unwieldy collections of words. The necessity for some such comprehensive name was heightened by the fact that in the early development of an oil field air is used as the flowing medium until enough wells are completed to build up the needed supply of gas for flowing.

Somebody with the faculty of getting to his destination by the shortest route used the term "flowing plant." That covered everything. Oil men took up the term promptly.

AVERAGE SEMINOLE OUTPUT

What is the average daily production of wells in the Seminole district, Oklahoma, when they are taken off of gas lift and put on the beam? What is the average economic limit of pumping wells in the Seminole district?—T. M. E.

It is not possible for this department to give a direct answer to these questions because individual wells vary widely in their behavior and because these are economic as well as physical problems. The production of a well on gas lift depends largely upon the formation pressure and upon the rate at which the formation pressure will force oil into the well, but whether or not the well or wells should be operated by gas lift or pumping is essentially an economic problem based upon the profits that can be derived from one method or the other.

Some wells that will produce as much as 500 bbls. a day by swabbing will not flow at all by gas lift. Some wells can not be profitably operated by gas lift at less than 500 bbls. a day. Others may be so operated at 400, 300, 200 or even 100 bbls. a day depending upon the physical and economics in each particular case and on each property.

One large company reports that the average daily production by gas lift when the wells are changed from gas lift to pumping is 200 bbls. in the Seminole district, but this is not true of some other companies whose physical equipment and underground conditions are different.

Similarly the minimum rate at which a well in the Seminole district can be pumped profitably depends upon the physical and economic problems applying to the particular well or to a group of wells. Some wells in the Seminole district are pumping as low as 5 bbls. a day profitably, whereas others that are capable of pumping 100 bbls. a day can not be pumped profitably because of the serious wear and tear upon the pumping equipment. Crookedness of the hole makes it especially difficult to pump these deep wells profitably.

In determining the cost of lifting oil by the gas-lift method it is common practice to allocate the costs per well in accordance with the compressed air or gas used. By this method it is found that in some wells it costs as much as 75 cents a barrel to lift oil by the gas lift and under such conditions it is often cheaper to pump the wells.

TUBING METHOD PREFERABLE

In bottom hole plugging with cement to exclude bottom water from a well, do you consider it best to run the cement with a dump bailer or by the tubing method?—D. B. O.

This question was discussed at length before a recent meeting of the A.P.I. Burbank Field Chapter. It was the consensus of opinion that successful work could be done by either method, but that there was a greater chance for failure with the dump bailer method. The tubing method was the more favorably regarded.

The objections to the dump bailer method were premature dumping, loss of continued agitation of the cement, and the sucking action of the bailer which lifted from the freshly dumped cement to the bottom of the hole. The dump bailer method was said to be all right when properly used, but it is frequently not used with resultant failures. The choice of methods depends largely upon the conditions to be met and the equipment that is available.

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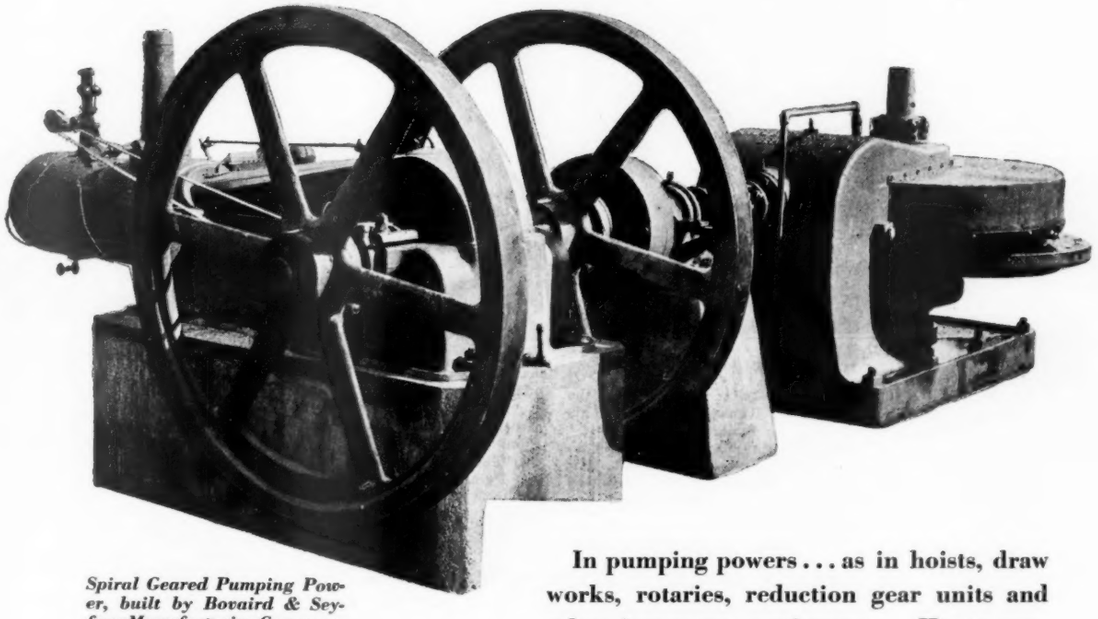

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EQUIPMENT AND SUPPLIES

FLOOD LIGHT DESIGNED FOR USE IN OIL FIELD

The Novo Flud Lite Generator outfit, manufactured by the Novo Engine Co., Lansing, Mich., is designed especially for oil field use, and according to the company insures plenty of light for 24-hour drilling rig operations. The entire plant is enclosed in a heavy steel house, which is weatherproof and can be placed anywhere convenient and locked when not in use.

Engine and generator are connected by an insulated flexible coupling, and mounted on an electric-welded base, with welded-in tubular cross members forming a rigid mounting of the lightest possible weight.

The generators are of Westinghouse design of the compound wound type. They are provided with commutating poles to eliminate commutator sparking and are self-regulating under varying conditions of load, requiring no rheostat or other means of regulation. The outfits are provided with enclosed terminal boxes located inside the housing, with a quick break switch and fused terminals for the line wires. There is no uncertainty as to how they should be connected up or operated.

All units are designed with a surplus power ratio, permitting the operation of forge blowers, grinders, or small air compressors, belted from the auxiliary pulley, even when the generator is operating under full load.

TRADE LITERATURE RECEIVED

Westco-Chippewa Pump Co., Davenport, Iowa, has issued bulletins on "Westco Pumps in Oil Refineries" and "Westco Single Stage Pumps." The Federal Steam Specialties Co., Oklahoma City and Tulsa, is distributor for Oklahoma.

Wagner Electric Corp., St. Louis, Mo., has issued a bulletin on Wagner transformer oil specifications originally prepared for its own organization only, but recently released for transformer buyers and users.

William Powell Co., Cincinnati, Ohio, has ready for distribution a 90-page oil well, field and refinery booklet describing bronze, iron and steel valves for the oil industry, together with useful dimension tables and other information.

"Why Oil and Gas Transportation Lines Are Oxwelded" and "Heads for Capping the Ends of Pipe" are among interesting articles in the April issue of Oxy-Acetylene Tips, published by the Linde Air Products Co., New York.

"Practical Aspects of Resuscitation," by Edward Steidle, dean of the School of Mines and Metallurgy, Pennsylvania State College, has been printed for free distribution by the Mine Safety Appliances Co., Pittsburgh, Pa.

The Sivyer Steel Casting Co., Milwaukee, Wis., announces publication of a book, "Dependability in Steel Castings," to mark the twentieth anniversary of the first heat by the company in 1909.

BUSINESS NOTES

The Griscom-Russell Co. has established a new sales office in the Union Trust Building, Cincinnati, Ohio.

The Garlock Packing Co., Palmyra, N. Y., formerly a closed corporation, has changed to an open corporation through sale of stock to the public. Policies, management and personnel will not be changed, it is announced.

The Central Alloy Steel Corp. has appointed S. H. Truitt as district sales manager of the Philadelphia district, to succeed C. C. Willits, resigned. Mr. Truitt formerly was assistant sales manager in Philadelphia.

THORNHILL NOW W-K-M MANAGER FOR KANSAS

Homer Thornhill, formerly store manager for the Continental Supply Co. in Nacona, Tex., has joined the field sales staff, oil field division, of the W-K-M Co., Inc., Houston, Tex. Mr. Thornhill,

Homer Thornhill

who becomes district manager for the W-K-M Co. in Kansas, will make his headquarters in Wichita.

Although concentrating particularly on drilling and production equipment, Mr. Thornhill, according to the company, will be prepared to take care of pipe line equipment needs also.

JACKSON TAKES OVER DUNN COMPANY ASSETS

An important merger of interest to the oil industry was effected with the purchase of the assets of the Dunn Manufacturing Co. of Oxnard, Calif., by the Byron Jackson Co., of Los Angeles and San Francisco. This move brings under one administrative head the manufacturing and distributing facilities of several oil tool producing plants on the Pacific Coast, permitting economies in production and distribution.

A few months ago Byron Jackson merged with other well known concerns, including Wilson & Willard Manufacturing Co., Wilson Oil Tools Corp., Rotary Disc Bit Co., U. S. Tool Co. and Craig Oil Tool Co. With the products of the Dunn Manufacturing company a comprehensive organization is rounded out. The sales and service force of the Dunn organization is being merged with that of Byron Jackson. The sales and service division in the Mid-Continent will be centered at Tulsa, where a large warehouse recently was opened.

Duplication of sales effort is eliminated by consolidation. Instead of maintaining separate engineering and research divisions for the several original companies, all are now combined and the augmented purchasing power of the parent concern will provide other economies, it is stated.

The Dunn products will continue to be manufactured at Oxnard for the time being, but the administration force has been removed to the Byron Jackson headquarters in Los Angeles.

At a recent meeting of the board of directors, the name of the Byron Jackson Pump Co. was changed to Byron Jackson Co. The original name was Byron Jackson Pump Manufacturing Co. The word "Manufacturing" was dropped from the name.

MID-CONTINENT OFFICE OF BLACKOR IS OPENED

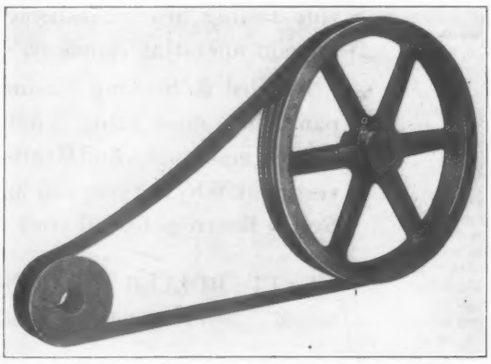
C. G. Wertzberger, former building and grounds superintendent of the National Petroleum Exposition, has been appointed district sales manager for the Mid-Continent division of the Blackor Co. Mr.

C. G. Wertzberger

Wertzberger has opened an office in Tulsa and from that point will maintain contact with the oil fields of his district. Blackor sales in Mid-Continent and Gulf Coast territories reached a point where installation of a convenient branch headquarters became wise, according to Fulton Lane, general manager of the main office in Los Angeles, Calif.

FAIRBANKS, MORSE & CO. NOW MAKING V-BELT DRIVE

One of the most recent developments in V-belt drives is the Flex-Mor, a product of Fairbanks, Morse & Co. of Chicago. The new drive is the result of numerous field and dynamometer tests to determine the factors of belt angles, slippage, the life of belts of various constructions, character of the various materials entering into the drive, and power capacity.



The belts used with this drive are built up of an outer belt jacket of duck treated with rubber to improve its wearing qualities. This jacket consists of two layers of duck enclosing a core made up of a layer of rubber, several layers of rubber-embedded cords, and another layer of rubber above the cords. The layer of rubber below the cords is compounded to withstand repeated compression, and the layer above the cords is compounded to withstand repeated tension. The rubber-embedded cords are laid at the neutral axis of the belt where there is the least tension or compression. These cords are made of long staple cotton and the construction is similar to that of cord tires. The various elements of the belt are assembled in the mold and vulcanized together.

The sheaves, made of semisteel, have been designed with particular reference to the angle and depth of the grooves so that the belt slippage is small. At the same time the relation between the angles of the belt sides and the grooves is such that the belt makes a gradual contact with the grooves as it bends around the sheaves. There is no sudden grabbing of the load.

In the use of elastic V-shaped belts in multiple short centers are possible, so that minimum floor space is required for a drive. It is possible also to increase the speed ratios and use higher speed motors. The efficiency of the V belt is reported by the manufacturers to have been 98 per cent or better on numerous tests.

V belts are available for transmitting power from a fraction of a horsepower up to 200 and more horsepower and they may be used for either reducing or increasing speeds.

JOINS HARBISON-WALKER

Raymond M. Sievers is now district sales manager of Harbison-Walker Refractories Co., Pittsburgh, Pa., with his headquarters in St. Louis, Mo. In 1904 Mr. Sievers entered the employ of the Evens & Howard Firebrick Co., St. Louis. In 1917 he was appointed sales manager in charge of all firebrick sales. In 1925 he was made vice president and general sales manager. As district sales manager of Harbison-Walker Refractories Co., his territory extends from the Mississippi River to the Rocky Mountain states.

DANIELS WITH GLOBE COMPANY

The Globe Manufacturing Co. of Battle Creek, Mich., manufacturer of car washers and air equipment for garages, auto laundries and filling stations, has announced the appointment of P. J. Daniels as sales and advertising manager. Mr. Daniels was an executive for nine years with the Duplex Printing Press Co., also of Battle Creek. Recently he organized the Lubrication Services, Inc., and served as its secretary.

READING ELECTS OFFICERS

At the annual meeting of stockholders and directors of the Reading Iron Co., held April 9 in the company's general offices, Reading, Pa., the following officers were elected for the ensuing year: L. E. Thomas, president; John M. Callen, vice president; P. N. Guthrie, Jr., vice president; R. J. Wenger, vice president; George W. Delaney, secretary; and Henry N. Yost, treasurer. Directors chosen were L. E. Thomas, John M. Callen, P. N. Guthrie, Jr., R. J. Wenger, A. J. Maloney, and Randolph Stauffer.

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THE NATIONAL SUPPLY COMPANIES

Natural Gas Developments

SOUTHERN PIPE LINE SALE TO GAS COMPANY

Southern Pipe Line Co. has called a special meeting of stockholders for April 30 to vote on the sale to Manufacturers Light & Heat Co. of a system of pipes extending from the West Virginia-Pennsylvania state line to Millway, together with an unused portion of the line between Matthews Farm and Philadelphia, and a branch line to Bramell Point, N. J., none of which is required for the business of the company. The sale is subject to approval of the Public Service Commission of Pennsylvania.

In a letter to stockholders, Forrest M. Towl, president, states shipment of oil to Philadelphia via Southern Pipe Lines Co. stopped in 1923. In 1925 company made its final delivery to that point. Part of the line between Millway and Matthews Farm has been sold.

"The company still owns three systems of lines between the West Virginia-Pennsylvania state line and Millway, about 200 miles," Mr. Towl says. "Two of these systems are still in use, and are handling only about 20 per cent of their full capacity, and there seems to be no prospect of any considerable increase in their business. The third system of pipes has a capacity nearly as great as the other two. This larger system has been used for transporting Mid-Continent oil destined to Atlantic seaboard points, but it is no longer required by this company for that or any other purpose, and there seems to be no probability that this larger system will ever again be so required, although the officers of the company have made every effort to find some use for this idle capacity," Mr. Towl continues.

The sale will not interfere with the present use of the remaining systems of the company for oil transportation and the company will still have all its stations, and lines able to carry about four times as much oil as is now being transported. If the sale is authorized, the company expects to be able to return to stockholders, from capital stock reduction account, about $10 a share.

TO FIND FLOW OF GAS WELLS

The method in common use for determining the capacity of natural gas wells is responsible for a large waste of gas. Serious damage to the producing capacity of many wells has resulted from allowing wells to "blow" unrestricted for 15 minutes in order that the maximum flow of gas can be determined, says the Department of Commerce. It is evident that a method of determining the potential capacity of a well without allowing it to blow wide open would be of great economic value.

The Petroleum Experiment Station, maintained jointly by the United States Bureau of Mines and the State of Oklahoma at Bartlesville, Okla., has, therefore, started an investigation of the fundamental relations involved in the flow of gas through gas sands and the relationships between gas flow and well capacity. Studies of over 400 gas wells located in different parts of the country have been made and the data correlated. The results of the investigation up to date indicate that a fairly simple and practical field method for determining the capacity of a gas well can be evolved.

ALBERTA GAS EXTENSION

CHATHAM, Ontario, Apr. 22.—The Canadian Western Natural Gas, Light, Heat & Power Co. of Calgary is planning to supply gas to the town of Foremost in southern Alberta. The company now secures a portion of its gas supply from a field a few miles south of Foremost.

COMMERCIAL MANUFACTURE OF HELIUM CONTRASTED WITH GOVERNMENT

By Charles E. Kern
Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Apr. 22.—The members of the Senate and House Committees on Appropriations have been given full information concerning the extensive campaign arranged by the Helium Co., a subsidiary of the Kentucky Oxygen-Hydrogen Co. of Louisville, Ky., for placing the helium industry on a commercial basis.

Since the Bureau of Mines began a survey of natural gas in 1919 to determine the helium content of thousands of samples collected, the utmost secrecy has been maintained. At the same time the bureau began to experiment in the production of helium.

The bureau has insisted from the beginning that all of its special knowledge in this respect is of such military importance that all information obtained should be the property of the Government and no encouragement has been given to any commercial interests contemplating furnishing supplies of this noninflammable gas.

The Navy Department has not recognized the necessity for a government monopoly of the manufacture of helium gas and during the past two years has entered into contracts with the Kentucky Oxygen-Hydrogen Co. for a large part of its supply. The War Department has so interpreted its appropriation bill that it has taken the view that its supplies of helium should be obtained only from government extraction plants.

To carry out its plans for the establishment of a commercial industry the Helium Co. has undertaken an exploration of the entire gas resources of the United States for the discovery of helium and has drilled a number of wells. This work, begun several years ago, encouraged the company to make the survey nation wide.

"We have been unable to get any data from the Bureau of Mines," said R. R. Bottoms of the Helium Co., "and could obtain no records of the helium content of the many specimens the bureau has collected.

"We have finally planned to redrill on structures in which wells were previously drilled and abandoned so that we may tell about these structures that have offered possibility of helium-bearing gas. In one case we found the helium content is higher than in any instance up to the present, the helium content being 7.8 per cent. The volume of helium-bearing gasses available to commercial concerns is believed to be equal if not in excess of the volume of helium gas in the Cliffeside structure which the Bureau of Mines is exploiting at Amarillo. The volume of helium the bureau estimates as being available in the Amarillo Field amounts to 100,000,000,000 feet of helium-bearing gas with a percentage of 1.7 per cent helium. While the structure available to industry is believed to contain less helium-bearing gas than the Cliffeside structure the volume of helium in this gas is believed to be equal to the volume of helium available at Cliffside.

"Our helium-bearing gas which we are putting through our extraction works at Dexter at this time runs 2 per cent helium. What we have obtained from the new field is four times as rich in helium as the gas being processed at Dexter. Of course, one well is not sufficient as a test of an entire gas field, but we estimate this sample with 7.8 per cent helium is representative of a single structure and we believe we are safe in accepting it as a fair method of estimating all of that helium-bearing gas.

"Our company has been studying this question for several years and the data we have collected has allowed us to arrive at a theory of the occurrence of helium-bearing gas in natural gas structures. Following up this theory we drilled this test well and our first result has been eminently successful in supporting the theory. So we feel sure our explorations for discovering helium-bearing natural gas have not been as hazardous as appeared two years ago when we initiated this investigation.

"We now propose to continue this survey and we have two scouting crews in the field and are preparing to get out a third scouting crew in the coming spring and at the same time we will pursue investigations in eastern fields from our head office. These three crews are all to work in western fields. One is in the Mid-Continent and Gulf Coast Fields and one in the Rocky Mountain section, the other on the Pacific Coast.

"The expense of duplication of the work of the Bureau of Mines is placed upon us because the bureau insists upon maintaining its information respecting the helium content of its samples of natural gas as confidential military information. We believe we are doing thorough work and the results of our exploration will be made public so that the natural gas industry may have full information through the columns of The Oil and Gas

(Continued on Page 184)

GAS FOR TEXAS TOWNS

HOUSTON, Tex., Apr. 20.—The Murchison Oil Co., which has just completed a 22-mile gas line from the Raccoon Bend Field to Brenham, Washington County, now is laying another 16-inch line from the same field to Hempstead and Prairie View.

The Murchison Oil Co., which obtains its gas from the Humble Oil & Refining Co. and Valley Oil Corp., joint operators at Raccoon Bend, is piping natural gas to Brenham, Hempstead and Prairie View, where the Texas Cities Gas Co. distributes it. Brenham formerly used artificial gas, but new gas distribution systems are being laid at Hempstead and Prairie View.

NEOSHO LINE COMPLETED

Work was recently completed on the construction of 15 miles of welded gas pipe line which connects with the main line of the Cities Service Gas Co. at Saginaw, a short distance south of Joplin, Mo., and extends in a southeasterly direction to Neosho. Gas will be available for both industrial and domestic consumption as soon as the supply line has been blown and tested. Construction of the town border regulating and measuring station at Neosho, Mo., has been completed.

GAS WELL AT BROOKVILLE

BROOKVILLE, Pa., Apr. 20.—The T. W. Phillips Gas & Oil Co. of Butler has brought in a large gas well on the Jordan farm, south of here. The yield of the well has not been gauged but is estimated several million feet.

DRESSER COUPLINGS FOR 400-MILE LINE

The Dresser Manufacturing Co. of Bradford, Pa., recently received the largest order ever placed with it for couplings. The order was received from the Mississippi Fuel Corp. of St. Louis, which is jointly owned by the Standard Oil Co. of New Jersey and several other large interests.

The Dresser couplings will be used in a 400-mile natural gas pipe line which will be built at an estimated cost of nearly $30,000,000. It is expected that several other large orders will follow the one just received. Plans have been made and work is already under way to improve manufacturing facilities so that the Dresser company will be in a position to take care of a much larger volume of business in the future.

EQUITABLE GAS EARNINGS

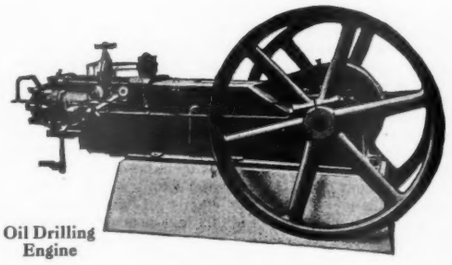
Gross earnings of Equitable Gas Co., Pittsburgh, Pa., and affiliated gas companies during the year amounted to $12,749,360.34, a decrease of $498,876.93, or 3.77 per cent. Because of a large increase (17.88 per cent) in the cost of gas purchased in 1928 as compared with 1927, operating expenses, maintenance and taxes totaled $8,671,645.35, an increase over 1927 of $262,790.32, or 3.13 per cent. Net earnings before appropriation for retirement (depreciation) reserve were $4,077,714.99, a decrease of $761,667.25, or 15.74 per cent. The sum of $1,726,359.65 was appropriated for retirement (depreciation) reserve. Gas sales for the year totaled 23,480,152,800 cubic feet, a decrease of 1,886,507,800 cubic feet or 7.44 per cent. A considerable part of this loss in sales is accounted for by the loss of one large temporary customer, a non-affiliated gas utility. A slight decrease in domestic sales was evident, but commercial and industrial sales increased 9.60 per cent and 5.35 per cent, respectively. Improvement in the domestic heating business was made and all classes of new business secured during the year were felt to be of a permanent nature. Developments by affiliated companies in Kentucky and West Virginia progressed satisfactorily during the year and the companies have the assurance of adequate supply and service for present and future sales of gas. Due to this the company has cancelled its largest gas purchase contract with outside interests, the effect of which will be reflected in operations during ensuing years. As other contracts expire the company should be able to develop its own leases and consequently improve results.

MIXED GAS FOR WINDSOR

CHATHAM, Ontario, Apr. 20.—The Windsor Gas Co., which for 21 years has supplied Windsor and the border cities with natural gas from the Tilbury Field, will this year erect an auxiliary plant to manufacture gas from fuel oil, for mixing with the natural product. This plant will have a maximum capacity of 6,000,000 feet a day. A gas holder of 1,000,000 feet capacity will also be erected, supplementing four of similar capacity erected last year to provide for natural gas reserve. The company is planning, when the growth of the border cities area demands it, to erect a large coking plant. Improvements in the past two years have involved a new investment of around $1,500,000, and a further $1,000,000 will be spent this year. The Windsor Gas Co. is a subsidiary of the Union Natural Gas Co. of Canada.

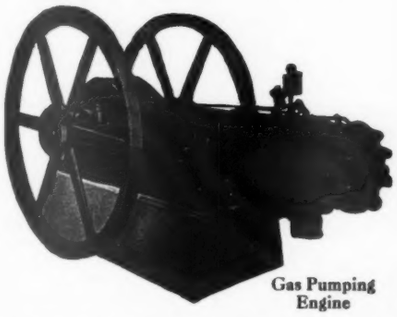
OIL AND GAS ENGINES

The FRANKLIN Engines



Oil Drilling Engine

New type of oil drilling engine for western and mid-continent service. An engine combining ample power, simplicity, quick starting, low fuel and lubricating cost.

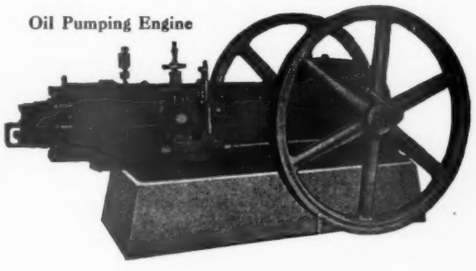


Gas Pumping Engine

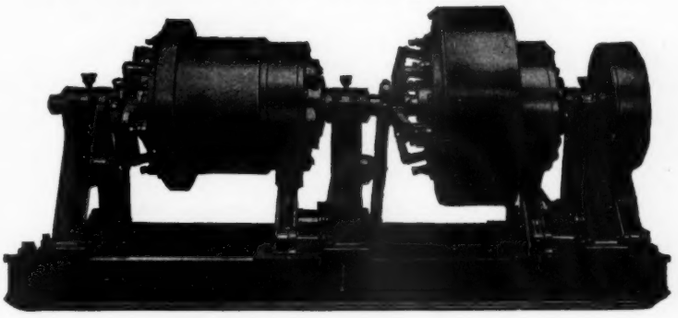
Franklin gas pumping engines are light, economical and powerful. They are interchangeable on the same block as gas drilling engines.

After you have finished drilling, move in one of these Franklin Pumping Engines. These pumpers come in 30, 40, 50 and 75 horsepower.

Oil Pumping Engine



Many Features Put FRANKLIN'S NEW LINE far Ahead of Old Style Clutches



Features of the 2 SD Drilling Clutch

Two speeds in either forward or reverse—all bearings enclosed—run in oil or grease.
All brake band and clutch discs adjusted without stopping the engine.
All brackets, bell cranks, toggle arms, brake cranks, levers, driving discs, spiders and sliding sleeves made of steel.
All similar parts of clutch interchangeable.
Belt driven—no shaft breakage.
The 2 SD Clutch will pull the largest bailer without faltering.

Type BG for Cable Tool Drilling, etc.

Here is a clutch that will operate satisfactorily and smoothly for cable tool drilling or for pumping operation. The BG Type has one speed forward and reverse. It is much the same construction as the 2 SD clutch.

FRANKLIN VALVELESS ENGINE COMPANY

Franklin, Pa.

Relationship of Government and Oil

Review of Legal Status of Petroleum in This and Other Countries. Fundamental Difference from Other Property

By Ernest R. Lilley, ScD.
Associate Professor of Geology at New York University

In the majority of the countries of the world the national and state or provincial governments exert a much more direct and definite influence upon the development and production of oil and other mineral industries than they do in the United States. This may be ascribed to a basic difference in the conceptions of the ownership of mineral deposits in these countries compared with that in vogue in the United States.

At the time of the break up of the old Roman Empire, the principle of individual land ownership had been well established. According to Roman law, the law that had prevailed over western Europe and the lands bordering the Mediterranean for centuries, the owner of the surface was also the owner of the rights to minerals that might be developed by him below that surface. This principle has been retained down to the present time in England, and was transplanted by the English settlers to America to become the governing principle of property rights in the United States.

During the Dark Ages of Medieval Europe, the rights of the individual in the continental countries were submerged by the power of the kings and the great feudal barons. The small independent farmer of the Roman Empire became the serf of this later period, his property gradually becoming the property of the king or the feudal baron. As such it could be disposed of as they saw fit. Thus, when mineral deposits of value were discovered, they were considered as belonging to the king or baron and not to his serf or permanent tenant and were handled accordingly. At the time of the French Revolution the peasants became the actual owners of the surface rights to the land that they had worked as serfs or vassals under the feudal system. As they had not enjoyed the rights to the subsurface and as the owners of these rights had been killed off or exiled, the rights naturally passed to the central government. While the change did not come so suddenly in other countries, the process was repeated in nearly all of the countries of western Europe during the early part of the nineteenth century.

In the Spanish Colonies in America, all mineral rights were reserved to the monarch from the beginning. This was natural as the products of the mines were those that were most easily transported to Europe and were in greatest demand. When these colonies declared their independence, it was logical that the states should succeed to the ownership of the mineral rights.

Beginning of Concessions

As the central governments, largely at that time controlled by dictators, attempted to revive the mining industry, they found themselves unable to proceed because of lack of capital. Large and liberal concessions were granted to individuals. The laws were changed so as to give the individual greater rights, the state surrendering the ownership of many of the substances below the surface to the owner of the surface. In Mexico, the central government retained the ownership of gold, silver and similar mineral deposits; but gave up title to coal, oil and allied substances. However, the rapid development of oil production during the twentieth century led to a complete reversal of this policy. In Mexico, this reversal reached a climax in the constitution of 1917. In this, oil was declared to be the property of the state.

The feudal system never gained the same degree of control in England that it had on the Continent. Large estates had been built up at the expense of the small landowner. However, the system was not carried to the extremes that characterized its operation on the Continent. The reaction was naturally less marked, the feudal baron passing by a process of gradual change into a citizen who differed but slightly from those who held title to little or no property. At no time was there any tendency for the central government to break down the principle that the owner of the surface was the owner of the minerals below the surface.

American Principle

The right of the surface owner to mine the minerals below his surface has never been questioned in the United States. It is one of the basic principles of our legal system and is given much credit as a factor of major importance in encouraging the development of our resources. Mining played a very minor part in the early history of the United States. It is doubtful whether the leaders of revolutionary days had any conception of the potential value of the mineral deposits lying between the Appalachians and the Mississippi River. The United States was the undisputed owner of land extending to the Pacific before the importance of mining became evident in that section. The abundance of unoccupied land and the lack of knowledge of its potentialities restrained Congress from the passing of laws that might retard the entrance of settlers and prospectors. In fact the desire to bring about rapid development of the West led to the development of the principle that the unoccupied lands of the area belonged to the individual who developed them. Laws designed to encourage settlement by farmers were passed by Congress at an early date. The development of mining came unexpectedly and before similar regulations for use of prospectors and miners had been prepared by Congress. The mining camps drew up their own codes of procedure. These formed the basis for later laws.

Mining Laws

The laws developed to handle the opening up of new mining areas and new farming sections were strictly of the regulatory type. There was no effort to hold back development and no attempt on the part of the government to secure income to itself. With the rapid decrease in the amount of unoccupied land remaining and the spread of the conservation sentiment came a change in the policy of the national government. While the right of the individual to secure mineral lands was not restricted directly, he was called upon to pay royalties or bonuses. The nation had begun to treat its unoccupied lands as the property of the people as a whole rather than land held in trust awaiting a claimant. However, by this time, the bulk of the lands that the oil industry is interested in had passed into the hands of individuals. These individuals had secured the lands for farming or rather surface uses in most cases. That the owners held the mineral rights was due solely to the fact that the United States had inherited the English system of subsurface rights and that throughout the early development of this country no condition had arisen to cause Congress to see the necessity of a change.

The purpose of bringing out these facts at such length is to show how from the very beginning the oil business of the United States has worked with a different type of producing property than that of the industries of other countries. In all of the great potential areas that are known outside of the United States at the present time, the nations or the states control the mineral rights by direct ownership. The situation in Mexico and in several of the South American countries is complicated by the shifting of the oil rights from the state to the individual and back again to the state, but in none of them are lands free of governmental control. The industry of the United States has been built up through the development of privately owned lands. In the Rocky Mountain States and in California some of the lands became private property through the processes of the old placer laws. In the Mid-Continent and eastern areas, titles on the bulk of the lands had been secured many years before the possibilities of oil were known to their owners.

Fundamental Difference

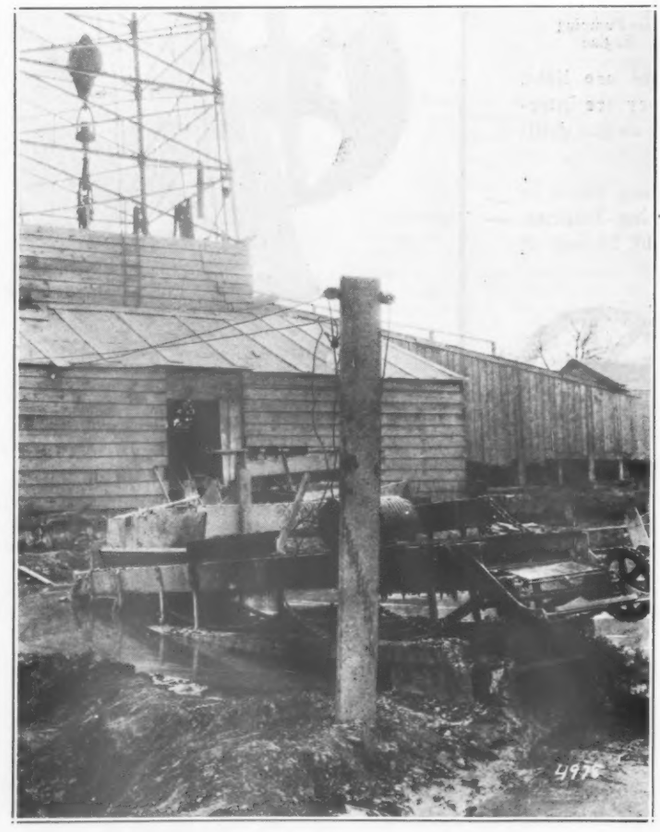
In considering the possibilities of governmental action designed to assist in stabilizing the oil industry or in bringing about greater conservation of the oil resources within the borders of the United States, it is wise to keep this fundamental difference between our country and others clearly in mind. Any law that attempted to divorce the rights of the subsurface from those of the surface or to restore the subsurface rights of private property owners to the national or state governments would not only be contrary to our constitution and established customs but likely to create a condition of chaos. It is useless to make comparisons between the actions that are taken by nations that own all of their oil rights and the actions which may be taken by our national or state governments. Much as he might condemn the waste that accompanies the development of some of our oil pools, no American would knowingly give his support to any law that tended to surrender the rights of the individual over the minerals below his surface.

The ownership of property gives the right to enjoy that property and to exclude others from it. Thus the owner of a tract of ground may expect that his right to the use of the minerals below it will be protected by the courts to the same degree as his surface rights are protected. Both English and American laws uphold this right and prescribe heavy penalties for the miner who is found guilty of extracting coal, clay, gypsum, limestone and similar solid and bedded minerals from below the property of a neighbor without his consent. It would appear that the owner or lessee of the oil and gas rights of a given property would have a legal

(Continued on Page 170)

This is the seventh article in a series written especially for The Oil and Gas Journal by Ernest R. Lilley, Sc. D., associate professor of geology at New York University, leader of the oil executives' course at the Wall Street division of the university, and author of "The Oil Industry," and "The Geology of Petroleum and Natural Gas."

DEVICE REMOVES BITS OF SHALE FROM ROTARY MUD



This device is designed to remove bits of shale from the circulating mud in rotary drilling operations, thus protecting the rotary pump and reducing the likelihood of these fragments lodging under the valve seats. The one shown in the picture is being used by the B. & A. Drilling Co. on the Gypsy Oil Co.'s No. 7 Miller north of Maud in the Greater Seminole area. As the fluid comes from the hole it flows onto the series of metal trays or carriers which, as seen in the illustration, are held between two endless chains. The fluid runs off these moving trays into the slush pit, but any pieces of shale drop into a separate pit at the outer end of the machine as the trays one by one are turned face downward and knocked sharply against a buffer.

EAST CENTRAL TEXAS

(Continued from Page 65)

at 132 feet. Killam & Phillips' No. 1 Roach, Toby Survey, same county, is drilling lime at 210 feet. The same operators' No. 2 Bryant, Naber Survey, same county, is rigged.

In Milam County, Bonwell & Hill's No. 1 Booher, east of Melano, Swoap Survey, is drilling hard shale at 1,658 feet. This test will go to 1,658 feet. J. M. Burkhead has rigged up for No. 1 Weignam, Milam County. Rogers & Peat's No. 1 Duncan, same county, is drilling Pecan Gap at 751 feet. Transcontinental Oil Co.'s No. 1 Derden, Navarro County, is rigged.

In Robertson County, Alexander and associates' No. 1 Alexander, J. Webb Survey, is drilling sand and sandy shale at 1,426 feet.

C. M. Joiner's No. 1 Bradford, 8 miles northwest of Henderson, Rusk County, was deepened to 2,516 feet in shale at which depth it bailed a small amount of dead oil.

Daily average production of East Central Texas for the week ending April 20 was:

East Central Texas	
Boggy Creek	3,584
Cedar Creek	115
Carrie	426
Mexia	5,507
Minerva	680
Nigger Creek	320
Powell	8,290
Richland	375
Thrall	35
Wortham	1,170
Total	20,502
Total previous week	20,391
Increase	111

SOUTHWEST WILDCATS

(Continued from Page 63)

major companies have been working over that territory.

Brooks County

W. G. French's No. 1 Riley Allen (American Maracaibo), San Antonita grant, 8,416 feet west line, 14,722 feet north line, is drilling at 1,060 feet.

Starr County

Ohio Oil Co.'s No. 1 Bass, Porcion 76, Block 71, has spudded in and is drilling. T. S. Oil & Gas Co.'s No. 1 Kelsey, Porcion 76, Block 11, located 1,500 feet north line, 500 feet west line, is drilling at 450 feet. The Texas Company's No. 1 V. V. de Guerra, Porcion 68, Share 92, located 600 feet east line, 6,280 feet south line, is drilling at 1,000 feet.

Webb County

G. S. Lumpkin's No. 1 H. Yeager, Porcion 33-34-35, Block 17, is location 1,170 feet east line, and 150 feet south line. L. W. Nelson's No. 1 Moglia, Survey 972, located 150 feet east line, 2,584 feet south line, is drilling in shells and lignite at 1,777 feet. Usher Carson's No. 2 D. Benavides, Survey 1,613, Block 11, located 150 feet north and west lines, is drilling at 900 feet.

Zapata County

National Oil Co.'s No. 1 Don B. Adams, Section 11, Block 4, spudded in and is drilling. John Pappas' No. 1 Cuellar, Porcion 33-34, Block 5, located 333 feet northeast lines, 194 feet southeast lines, is drilling at 915 feet. R. V. Hill's No. 5 Ramirez, Survey 627, located 400 feet northwest lines and northeast lines, is rigging up.

Atascosa County

Amphion Oil Co.'s No. 1 Sam Schlisser, Farm B, 300 feet northeast lines, 600 feet southeast lines, at 1,450 feet is drilling in Indio with shells.

Bastrop County

Gypsy Producing Co.'s No. 1 Lottman estate is shut down at 2,320 feet. Howell Oil Corp.'s No. 1 F. Wichman, near town of Page, is drilling water well and rigging up with rotary. E. W. Ogden's (Billy Mayfield) No. 2 McCoyle (formerly No. 1 McColl), Stephen F. Austin Survey, at 2,071 feet has showing for oil.

Bexar County

Humble Oil & Refining Co.'s No. 2 Oppenheimer, J. M. Urriegas Survey, 900 feet north of No. 1, is drilling in sandy shale at 4,390 feet. Indian Creek Oil & Gas Co.'s No. 1 W. Wolfsohl, Survey 5, J. A. Navarro, 180 feet CEL, is drilling at 1,580 feet, 300 feet in Edwards, having hard drilling. W. M. Morgan's No. 1 H. L. Martin is drilling at 420 feet having passed hard rock. Moore-Jauer's No. 1 Holly R. Ellison, T. York Survey, 2,916 feet east line, 1,500 feet south line, is drilling at 825 feet in Comanche Peak, gas getting strong as they go deeper. J. Morgan Russell's No. 1 G. A. C. Halff is location in city limits of San Antonio.

Calhoun County

B. F. Thompson's No. 1 Thomas, John P. Tully Survey, 910 varas north, 5 minutes 30 seconds west of north corner of John C. Post Survey, heavier rig is to be installed at 2,748 feet, present depth, and test will be carried to 4,000 feet if necessary.

Caldwell County

Alexander & Smith's No. 1 Cardwell, J. P. Bell Survey, 150 feet south and west lines, is drilling at 1,460 feet. Al Buchanan and others' No. 1 Callahan, John Roe Survey, 150 feet east line, 800 feet south line, is drilling at 2,088 feet in chalk topped 1,875 feet and running high about 20 feet compared with other test drilled in that section.

Edwards County

A. M. Griffith's No. 1 Wardlaw, Section 60, Block B-8, located 1,050 feet west line, 150 feet south line, is drilling at 1,260 feet.

Fayette County

Marshall & Moore's No. 1 John A. Kerr, M. Muldoon League No. 5, about 250 varas north line and little west of center, is drilling at 2,364 feet in Cook Mountain and showing some gas. National Oil Co.'s No. 1 J. C. Melcher, S. M. Williams League No. 1, located 300 feet north and east lines, is drilling at 2,920 feet in brown sandy shale and shells.

Goliad County

Booth McCarson's No. 1 Murray, Survey 3, Block 11, located 200 feet west line, 150 feet south line, is drilling at 1,460 feet.

Gonzales County

Alexander & Smith's No. 1 Billings, G. Gwinn Survey, NW cor., spudded in and shut down. Joe Bruner's No. 1 Miller, Richard Heath Survey, 3,040 feet north line, 200 feet east line, is shut down for few days to set surface casing. Crown Petroleum Co.'s No. 1 Hattenbach, James Jones Survey, 900 feet east line, 200 feet south line, has been spudded in. W. D. Flynn's No. 1 Wilhausen, S. Bateman Survey, east central part of lease, is shut down at 5,212 feet. Finnell & Elam are making location 5 miles north of Waelder. Linderman Brothers' No. 1 Frampton, Richard Heath Survey, 2,120 feet north line of Creek, 1,930 feet east line of farm, has set 84 feet of surface casing. W. G. Malone's No. 1 Staton, J. M. Salinas Survey, 375 feet southwest lines, 1,275 feet northwest lines, is drilling at 400 feet.

Guadalupe County

Pat Armstrong is straightening titles for No. 1 Halm, Wakefield Survey. J. J. Christie's No. 1 Taylor Thomas, Gustavus Chotwell Survey, 1,100 feet southwest lines, 1,130 feet southeast lines, is shut down on account of high water. A. G. Kiffer's No. 1 B. B. Dix, Ira Nash Survey, 610 feet north of road and 320 feet to east line, is drilling below 800 feet. Mid-Kansas Oil & Gas Co.'s No. 1 C. Lehmann, J. B. Cowan Survey, 900 feet northeast lines, 150 feet southeast lines, is rigging up with rotary. Magnolia Petroleum Co.'s No. 1 F. A. Whitley, Samuel Highsmith Survey, 300 feet center of northeast line, is drilling at 2,300 feet. Miller Brothers' No. 1 Gib Springs, E. Cortari Survey, 450 feet west line, 775 feet south line, is drilling at 2,369 feet, 100 feet in Edwards is very hard cap looking like flint. Eugene Sights' No. 1 Woehler, John King Survey, 310 feet north line, 210 feet east line, is drilling in dobie at top of Edwards.

Kendall County

A. D. Gibbs' No. 1 A. J. McCrocklin, 6 miles southeast of Sisterdale, is moving in tools.

Jackson County

The Texas Company's No. 1 W. C. Moore, I.&G.N. Survey, 5,108 feet south line, 150 feet west line, is drilling at 3,600 feet. Wright Brothers' No. 2 Classen is standing at 3,945 feet; No. 8 Drushell has derrick up.

Karnes County

Hurador Oil Co.'s No. 1 W. E. Porter, 6 miles south of Runge, is drilling at 1,000 feet. Townsend is making location for test 4½ miles northwest of Runge.

Kerr County

L. R. Page and others' No. 1 Neal, Survey 2, Block 15, center, has rig up and tools on ground to spud in.

Kimble County

H. A. McLean's No. 1 Cannon, Section 741, located 330 feet south and east lines, is drilling at 125 feet.

Kinney County

Lloyd Oil Co.'s No. 1 G. Bedell Moore estate, Survey 117, located 1,320 feet CNL, is shut down at 1,000 feet hole full of water at 300 feet. Mardon Oil Co.'s No. 1 Jim Clamp, Survey 346, Section 1,492, at 2,540 feet hole filled with oil when casing was pulled.

Maverick County

Ryan Consolidated Petroleum Co.'s No. 2 Indio is at 1,320 feet total depth. Rycade Oil Corp.'s No. 4 J. M. Chittim, Section 104, Block 7, is drilling at 475 feet; No. 3 Chittim, Section 116, Block 7, is drilling at 3,419 feet; No. 4 Sullivan, Section 112, Block 7, is drilling at 200 feet.

Medina County

California-Medina's No. 1 Rothe, Survey 1,012, has resumed drilling at 3,282 feet and is coring. Donaldson Oil Development Co.'s No. 1 Adams Co., Survey 25, located 150 feet east line, 1,227 feet south line, is standing at 3,125 feet. Lynch and others' No. 1 Mott at 580 feet has resumed drilling after shutting off water. Cecil Switzer's No. 1 Zerr has started to drill in. T. N. T. Drilling Co.'s No. 1 Bendele, Survey 470, located 150 feet west line, 500 feet south line, is moving in machinery. W. W. Woodworth's No. 1 Johnson, J. Hall Survey, 450 feet south and east lines, has been spudded in.

Milam County

J. M. Burkhead's No. 1 C. Weigmann has been spudded in. E. L. Chapman's No. 1 J. M. Gilchrist, J. J. Acosta Survey, 150 feet north and west lines, is rigging up. H. E. Eliott's No. 1 J. C. Moore is erecting derrick. Groneman Brothers' No. 1 Dornhoofer, 3 miles west of Rockdale, is moving in rig and has derrick up. J. C. Hawkins is making location 1½ miles northwest of Thorndale. Rogers & Heep's No. 1 J. B. Duncan, J. J. Acosta Survey, 1,800 feet north line, 750 feet east line, is drilling at 1,100 feet.

McMullen County

Natt Holman's No. 1 Shiner, Henry M. Brewer Survey, 7,515 feet south of Nueces River, 3,084 feet east line, is shut down at 790 feet to lay water line.

Nueces County

Pearson and others' No. 1 Bluntzer, Block 3, NW cor., is drilling at 3,000 feet. R. & G. Corp.'s No. 1 Roberts is location; No. 1 Ragland is standing at 3,003 feet, contract depth. Nueces River Basin Development Co.'s No. 1 F. C. Allen, G. Farrier Survey, 1,596 feet south line, 474 feet west line, at 3,035 feet derrick blew down with drill stem stuck in and it is being rebuilt and new drill stem has been ordered. F. P. Zoch's No. 1 Kelly, 7 miles southwest of Corpus Christi, is drilling at 2,600 feet. F. P. Zoch & Texas Production Co.'s No. 1 Nesaloney, 8 miles north of Agua Dulce, is rigging up.

Refugio County

Blanco Creek Oil Co.'s No. 1 St. John, J. Scott Survey, 708 feet northwest lines, 3,074 feet northeast lines, is shut down at 2,544 feet for drill pipe. Mission Drilling Co.'s No. 1 Mitchell, south end of city, is at 4,036 feet swabbing and trying to control salt water.

San Patricio County

J. T. LaPrade's No. 1 D. Odem, Herron Survey, 1 mile south of Sinton, is drilling below 2,000 feet. George B. Pickett's No. 1 Whitworth, NW NW Section 60, is shut down at 3,250 feet.

Zavala County

Tritex Oil Co.'s No. 1 Clay Burns is drilling at 710 feet; No. 4 West is drilling at 1,000 feet; No. 6 West is shut down at 520 feet; No. 1 Childress has been spudded in and is down 300 feet.

SOUTHWEST TEXAS

(Continued from Page 63)

Survey 753, Block 13, location only, has been abandoned.

A. G. Deck's No. 1 de la Garza, Survey 48, Block 47, has been abandoned dry at 3,170 feet.

Refugio County

Mission Drilling Co.'s No. 3 Rogers (Houston Gulf Gas Co.'s No. 1 Rogers is the same), abandoned 3,686 feet, making salt water.

Jim Hogg County

Magnolia Petroleum Co.'s No. 41 Merchants State Bank, Survey 155, has been abandoned dry at 5,200 feet.

NEW LOCATIONS MADE

Bee County

Mission Drilling Co.'s No. 2 Ray in Pettus gas field, is drilling at 2,400 feet.

Bexar County

Amelia Balzart's No. 3 J. P. Adams, Dobrowolski Field, offsetting the No. 1, or discovery well, has derrick up.

American Central Oil & Gas Co.'s No. 4 Mary McConnell, W. G. Baker Survey No. 138, located 806.6 feet to east line, 685.5 feet to south line, is hauling in derrick material.

Caldwell County

H. J. Powell's No. 2 Cora Malone, A. Floyd Survey, is location 300 feet south of No. 1 of Carl Brothers & Suttle, and 150 feet from west line.

Turman & Brown's No. 1 A. C. Bridges is location.

Shell Petroleum Corp.'s No. 1 Clyant Smith is location 150 feet south and east lines.

Humble Oil & Refining Co.'s No. 1 J. L. Northcut is rigging up with rotary.

T. C. Hadley's No. 2 Merriweather, A. Floyd Survey, 450 feet to west line, in center of tract, is building derrick.

Gulf Production Co.'s No. 1 J. L. Northcut is drilling at 120 feet in shale and boulders.

Cranfill & Reynolds' No. 3 Hanson, James Hinds Survey, is rigging up with rotary.

Cranfill & Reynolds' No. 2 Hanson, James Hinds Survey, is rigging up with rotary.

Duval County

Magnolia Petroleum Co.'s No. 2 Hahl, Survey 250, Block 24, is location 150 feet north and east lines.

S. & O. Oil Co.'s No. 2 Hahl, Survey 250, Block 23, located 160 feet north and east lines, is moving on.

The Texas Company's No. 3 Hahl, Survey 250, Block 18, located 150 feet south and west lines, has derrick up.

Gonzales County

William F. Morgan's No. 1 J. L. Lamkin, Winslow Turner Survey, is location 150 feet west line, 810 feet south line.

Frank Sorrell's No. 2 Wilkenson, 100 feet west of No. 1 and between towns of Slayden and Harwood, is location.

Jim Hogg County

Magnolia Petroleum Co.'s No. 42 Merchants State Bank, Survey 235, is location 330 feet west line, 4,254 feet north line.

Refugio County

Mission Drilling Co.'s No. 1 Powers has been spudded in.

Rogers & Heep and others' No. 1 Fox estate, Block 4, is location.

Houston Gulf Gas Co.'s No. 2 Rose Lambert, central portion, has set and cemented casing at 3,646 feet.

Webb County

O. W. Killam's No. 9 Bruni, Survey 3, location to be announced later, has derrick up.

Humble Field—Duval

Humble Oil & Refining Co.'s No. 15 Kohler, Survey 401, located 825 feet east line, 165 feet north line, set 10-inch casing at 269 feet; No. 16 Kohler, Survey 144, located 225 feet south line, 165 feet west line, is rigging up; No. 17 Kohler, Survey 399, located 165 feet north and west lines, is drilling at 2,629 feet, tested 3 joints of oil at 2,262-75 feet; No. 18 Kohler, Survey 402, located 165 feet south and east lines, at 1,830-35 feet tested small gas well; No.

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20 Kohler, Survey 251, is location 165 feet north line, 2,475 feet east line; No. 21 Kohler, Survey 396, located 545 feet east line, 495 feet north line, at 1,850-54 feet, tested small gas well; No. 22 Kohler, Survey 395, located 495 feet west line, 165 feet north line, is rigging up.

Driscoll Field

Robert Driscoll's No. 15 Driscoll, Survey 448, set 10-inch casing at 208 feet and is drilling at 2,315 feet after having gas blowout from sand at 500 feet.

Schoolfield & O'Byrne

Magnolia Petroleum Co.'s No. 6-B Hahl, Survey 61, located 3,450 feet east line, 600 feet south line, is rigging up. G. M. Partee's No. 2 Moody, Survey 60, located 450 feet west line, 150 feet north line, has derrick up. S. & O. Oil Co.'s No. 6-B J. Bowe, Survey 250, Block 21, located northwest corner, is in sand at 2,314-14 feet and is setting casing.

Randado Field—Jim Hogg

Magnolia Petroleum Co.'s No. 41 Merchants State Bank, Survey 155, located 150 feet north and east lines, is at 5,022 feet drilling in lime shells. Randado Oil Corp.'s No. 35 Palacious, Survey 291, Block 2, located 150 feet south line, 450 feet east line, is standing at 100 feet.

Henne-Winch & Fariss Field

A. L. Kitselman's No. 1 Lopez, Survey 255, Block 6, located 289 feet north line, 300 feet west line, at 3,402 feet is plugging back to make gas well at 1,943-67 feet. The Texas Company's No. 2 Vela, Survey 589, is at 42 feet setting 10-inch casing.

Alworth Field

Alworth-Stevens-Hild's No. 16 Alworth, Survey 40, Block 14, located 150 feet northeast lines, 660 feet southeast lines, is moving on.

Schott Field—Webb

Livingston & Payne's No. 1 Guerra-Ochoa, Survey 58, located 917 feet east line, 470 feet south line, is drilling at 200 feet.

Albercas Field

Sun Oil Co.'s No. 12-A Yeager-Strohman, Share 5, located 4,675 feet north line, 150 feet west line, is standing at 2,153-55 feet. Rycade Oil Corp.'s No. 8 Yeager-Strohman, Share 5, located 1,950 feet north line, 150 feet east line, is standing at 2,145 feet.

Aviator or Bruni Tracts

Aviator Gas Co.'s No. 2 Bruni, Survey 2,082, is location 1,120 feet east line, 1,170 feet south line. G. C. Salley's No. 1 Puig, Carter-Pinkton tract, 220 feet west line, 150 feet south line, has sand at 1,608-09 feet.

Carolina-Texas Pool

R. O. Barnsley's No. 1 Barnsley, Survey 268, Block 15, located 581 feet south line, 150 feet east line, is location. A. G. Deck's (Miller-Daniels) No. 1 de la Garza, Survey 48, Block 47, located 150 feet north and east lines, is standing at 2,709 feet. W. R. Shankle's No. 1 Webster, northeast southeast, Survey 684, located 150 feet south and west lines, at 3,045 feet is drilling after testing dry at 3,038 feet. The Texas Company's No. 2 Benavides, southeast Survey 683, located 1,000 feet east line, 150 feet north line, is drilling at 1,000 feet. Trapshooter Reilly Oil & Royalties Co.'s No. 1 Benavides, southeast northwest, Survey 685, located 150 feet north and east lines, is location.

Magnolia-Cole Field

Cole Petroleum Co.'s No. 67 Benavides, Survey 412, Block 12, located 313 feet east line, 160 feet north line, is standing at 38 feet. Houston Oil Co.'s No. 4-D Benavides, Survey 753, Block 13, is location 160 feet south line, 822.5 feet east line; No. 17-D Benavides, Survey 753, Block 5, is location 160 feet south and west lines. Magnolia Petroleum Co.'s No. 1 King Benavides, Survey 694, Block 12, located 150 feet south and east lines, at 2,388-90 feet tested gas and is drilling deeper; No. 1 J. C. Valdez, Survey 754, Block 15, located 150 feet south and west lines, has derrick up.

Simms Gas Field

Houston Oil Co.'s No. 1 Dinn, Survey 666, located 1,172 feet north line, 160 feet east line, has spudded in. Simms Oil Co.'s No. 4 Dinn, Survey 666, located 660 feet south line, 150 feet east line, has sand at 1,742-43 feet and is setting casing.

Cole Gas Field

William F. Morgan's No. 3 King-Harper, Survey 323 (location to be announced later), is coring for sand below 1,700 feet. O. W. Killam's No. 4 (1) Bruni, Survey 5, Block 2, located 150 feet northwest lines, 86 feet southwest lines, at 1,972 feet cored sand showing gas and is drilling at 2,100 feet.

Jennings Field—Zapata

Trapshooter Reilly Oil & Royalties Co.'s No. 2 Hinnant, Survey 74, located 757 feet east line, 1,170 feet south line, at 1,595 feet is coring for sand. T. P. Morgan's No. 1 Hinnant, Survey 74, is in sand at 1,612-14 feet after passing rock at 1,607-12 feet. South Texas Production Co.'s No. 4-A Jennings, Cerrito Blanco grant, 8,250 feet southwest lines, 6,825 feet southeast lines, is drilling at 1,580 feet.

Somerset Field—Atascosa

W. R. Hamilton's No. 16 R. T. Hughes, Survey 518, J. Sharp, is location in west central part of lease.

Yoast Field—Bastrop

Atlantic Oil Production Co.'s No. 5 Andy Yoast, A. Garcia Survey, 300 feet east of No. 4, is drilling. The Texas Company's No. 5 Andy Yoast, A. Garcia Survey, 300 feet east of No. 4, is drilling.

Somerset Field—Bexar

Schimmel Production Corp.'s No. 1 H. F. Gayle, C.E.P.I.&M. Survey, Block 2, is location 250 feet west line, 895 feet south line; No. 2 H. F. Gayle, same survey and block, is location 350 feet north line, 150 feet east line; No. 1 J. Frees, same survey and block, is location 250 feet east line, 829 feet south line; No. 2 J. Frees, same survey and block, is location 679 feet north of No. 1.

Dobrowolski Field

F. H. Eckert's No. 4 Paul Dobrowolski, Section 52, Block 4, 450 feet south line, 150 feet east line, is drilling at 250 feet.

Gas Ridge Area

Medio Oil Co.'s No. 9 Cohen, 500 feet southeast of No. 7, is shut down at 470 feet.

Pettus Gas Field—Bee

Mission Drilling Co.'s No. 1 Ray on lease bought of Dr. H. E. Hewitt is drilling.

Dale Field—Caldwell

The Texas Company's No. 2 Jeff Moore, J. Gilbert Survey, 600 feet northwest lines, 1,600 feet southwest lines, is drilling at 1,400 feet in shale.

Luling Field

United North & South Development Co.'s No. 1 G. C. Gideon, Miles Dykes Survey, 880 feet north line, 320 feet west line, is drilling at 3,850 feet in Glenrose which is rather broken.

Joe Bruner Field

Tips de Armond's No. 2 Carter, Gerren Hinds Survey, 170 feet west line, 147 feet north line, is drilling at 1,005 feet and showing some gas. Buchanan and others' No. 1 Trap Briscoe, P. B. McCearly Survey, 150 feet south and east lines, is standing at 2,744 feet. E. R. Brawn and C. O. Miller's No. 2 R. W. Carter, Gerren Hinds Survey, 150 feet north and west lines, has derrick up. Forest Oil Co.'s No. 1 Bridges is drilling at 1,375 feet in shale and boulders; No. 1 J. H. Fleming, A. Floyd Survey, 150 feet northeast lines, 75 feet southeast lines, is at 2,748 feet waiting on pump. Gulf Production Co.'s No. 10 R. W. Carter, Gerren Hinds Survey, is at 1,352 feet in shale; No. 11 R. W. Carter, Gerren Hinds Survey, is at 2,249 feet, setting casing at 2,179 feet in chalk; No. 12 R. W. Carter, Gerren Hinds Survey, is drilling at 1,922 feet in shale; No. 6 J. D. Wright, Gerren Hinds Survey, 150 feet northwest corner, is drilling at 2,657 feet in Edwards topped 2,656 feet; No. 8 J. D. Wright, Gerren Hinds Survey, is drilling at 1,075 feet in shale and boulders. T. C. Hadley's No. 1 Merriweather, A. Floyd Survey, 119 feet north line, 150 feet east line, at 2,749 feet, is to plug back; No. 1 J. M. Hanson, James Hinds Survey, 150 feet south and east lines, has derrick up. Humble Oil & Refining Co.'s No. 1 Trap Briscoe, 150 feet southwest corner, is rigging up with rotary; No. 4 L. G. Hanson, James Hinds Survey, 150 feet northeast corner, is rigging up with rotary; No. 4-A Moses & Baggett, 300 feet west of No. 1, is drilling at 2,616 feet in Georgetown; No. 8-A Moses & Baggett, Gerren Hinds Survey, is drilling after setting 41 feet of 10-inch casing; No. 3-B Moses & Baggett, Samuel Shupe Survey, 150 feet east line, 1,050 feet south line, has derrick up; No. 4-B Moses & Baggett, 1,350 feet south line, 150 feet east line, has derrick up; No. 1 J. A. Northcutt, James Hinds Survey, 150 feet southeast corner, has derrick up; No. 1 Clyant Smith, 150 feet northeast corner, is drilling at 2,713 feet in Edwards topped 2,705 feet; No. 1-A Tiller, James Hinds Survey, 150 feet west line, 1,050 feet south line, has derrick up; No. 2-A Tiller, 300 feet north of 1-A, has derrick up; No. 1-B Tiller, 150 feet west line, 1,050 feet south line, has derrick up; No. 2-B Tiller, 150 feet east of road and 219 feet north line, has derrick up; No. 3-B Tiller, James Hinds Survey, 150 feet northwest corner, is location; No. 1 Tom Tiller, James Hinds Survey, 150 feet northeast corner, is drilling at 1,292 feet in shale and boulders. Luling Oil & Gas Co.'s No. 1 G. R. Carter, Gerren Hinds Survey, 150 feet north and west lines, is at 2,380 feet in chalk. Lutex Oil, Inc.'s No. 4 Joseph Wilson, A Floyd Survey, 150 feet west line, 450 feet north line, is at 2,690 feet waiting on pump. Herbert Morgan and others' No. 1 Caldwell County land, James Hinds Survey, is building derrick. Morgan-Duke's No. 2 Cora Malone, A. Floyd Survey, 300 feet southwest of No. 1, is partially rigged up. Shell Petroleum Corp.'s No. 3-B Robert W. Carter, Gerren Hinds Survey, is at 2,680 feet in Edwards waiting on cement; No. 2 New, James Hinds Survey, 340 feet north of No. 1, at 2,749 feet is rigging up with cable tools to plug back to stop small flow of sulphur and salt water; No. 4 New, James Hinds Survey, 340 feet north of No. 3, is drilling at 2,170 feet in Taylor marl; No. 6 R. W. Malone, A. Floyd Survey, is location 700 feet south and east lines. The Texas Company's No. 1 R. W. Carter, Gerren Hinds Survey, 150 feet south and east lines, at 2,680 feet is waiting on cement. Turman & Brown's No. 1 Beversdorf, A. Floyd Survey, is location 150 feet southeast lines, 131 feet southwest lines.

Sullivan Field—Gonzales

Benedum & Trees' No. 1 J. E. Lamkin estate, Winslow Turner Survey, is drilling around 3,650 feet. Empire Gas & Fuel Co.'s No. 2 Norwood, Winslow Turner Survey, 600 feet northwest of No. 1, is drilling at 2,700 feet.

Luling Field—Guadalupe

A.B.A. Oil Co.'s No. 4 Britton Harris is shut down at 1,250 feet for boiler repairs.

Kingsville Field—Kleberg

Humble Oil & Refining Co.'s No. B-5 Dennett, Section 38, Block 19, located 400 feet north of No. 1, is drilling at 2,142 feet in shale; No. 4 Flato, Section 40, Block 10, located 250 feet east line, 450 feet north line, is at 5,900 feet approximate depth with 17 feet of sand showing oil and is setting casing to test.

Agua Dulce Field—Nueces

Agua Dulce Oil & Gas Co.'s No. 1 Otto Wolters, Benton's pasture, Section 34, is at 2,047 feet with sulphur water, standing. R. & G. Corp.'s No. 1 Brown, George H. Paul Subdivision, Section 87, is location; No. 1 Perkins, W. W. Wright Survey, 150 feet west line, 1,920 feet south line, is standing at 3,510 feet; No. 2 Ed Allen, Lot 5, Section 6, about 1,900 feet east of No. 1, has its derrick up.

Saxet Field

Saxet Gas Co.'s No. 5 Dunn is location 1,500 feet southwest of No. 1 Dunn, discovery well of the field.

Refugio Field—Refugio

Benedum & Trees' No. 4 Claude Heard, 600 feet south of No. 3, is rigging up. Houston Oil Co.'s No. 10 Rooke at 3,680 feet has sand with oil. Houston Gulf Gas Co.'s No. 4 O'Brien, Survey 4, south central, at 2,500 feet is drilling at old depth after sidetracking at about 800 feet; No. 1 J. F. B. Heard, has derrick up and is moving in rig; No. 8 James Agnes Lambert at 3,636 feet has gas sand and set casing; No. 2 Rooke, 700 feet north of No. 1, at 86 feet had strong flow of water with some gas; No. 7 Shelly is drilling at 1,800 feet. Mission Drilling Co.'s No. 1 J. E. Fox heirs, townsite tracts, is drilling at 1,700 feet. Oignfer Oil Co.'s No. 1 Ryals, townsite tracts, is at 3,670 feet preparing to bail. Refugio Development Co.'s No. 1 City of Refugio, street lease between Blocks 12 and 13, is drilling at 3,100 feet. Saxet Gas Co.'s No. 7 Claude Heard, 150 feet south of No. 6, is drilling.

White Point—San Patricio

Spencer & Rhondes' No. 2 J. M. Bennett, A. S. Taft Survey, 960 feet west line, 400 feet south line, tested dry at 2,290 feet and is drilling deeper.

KANSAS FIELDS

(Continued from Page 58)

has been abandoned at 3,428 feet. Dewey and Barnsdall Oil Co.'s No. 1 Smith, SE cor. SW NE, Section 36-31-4, is dry and abandoned at 3,458 feet. Lewis Production Co.'s No. 1 Sitton, NE cor. SE NW, Section 30-31-6, is dry and abandoned at 3,040 feet. Trees Oil Co.'s No. 1 Manser, SW cor. NW NE, Section 12-32-6, has been completed for 1,250,000 feet of gas in sand at 2,428-51 feet.

Greenwood County

Sheedy and others' No. 3-B Green, SE cor. NW NW, Section 12-23-9, is pumping 20 bbls. from sand at 2,340-74 feet. Empire Oil & Refining Co.'s No. 12 Edwards, SE cor. NW, Section 21-23-11, made 375 bbls. from sand at 1,865-1,974 feet.

Harvey County

Garland and others' No. 1 Cox, NE cor. Section 27-24-1w, is dry and abandoned at 3,517 feet.

Marion County

L. E. Beck's No. 1 Church Lot, NE cor. Section 22-17-4, Lost Springs Pool, has been completed for 30 bbls. in chat at 2,390-2,447 feet. Courtney Davis' No. 1 Rampel, SW cor. NW, Section 7-19-3, was completed for 275 bbls. in Wilcox sand at 2,879-95 feet.

Saline County

Kenny Coastal Co. has the rig on the ground for No. 1 Hughes, NE cor. Section 20-13-4w.

Sumner County

Marland Oil Co. and Carter Oil Co. moved the rig in for No. 1 Kratz, SW cor. NW, Section 26-34-2. Morgan Carey and others' No. 1 White, SW cor. SE SW, Section 16-35-2, has been completed for 5,000,000 feet of gas in sand at 3,330-72 feet.

Sedgwick County

Bu-Vi-Bar Petroleum Corp. is building the rig for No. 3 Shawver, NE cor. SE NW, Section 7-26-1, Valley Center Pool. H. H. Patton and others' No. 1 Burnham, NE cor. Section 22-25-1, is dry and abandoned at 3,580 feet. Montour Oil Co.'s No. 1 Lavender, CWL E half SE SW, Section 6-26-1, made 1,200 bbls. from sand at 3,384-91 feet. Derby Oil Co.'s No. 1 Gorman, CEL NW SW, Section 6-26-1, was completed for 1,265 bbls. in sand at 3,364-74 feet.

Bu-Vi-Bar Petroleum Corp.'s No. 2 T. Goodrich, SE cor. NE SW, Section 6 26-1, made 270 bbls. from sand at 3,372-87 feet. No. 2 Branch, SE cor. SW SE SW, Section 6-26-1, flowed 1,125 bbls. from sand at 3,373-78 feet. Allison & Fitzwilliams' No. 1 Kelly, SW cor. NW NW, Section 6-26-1, made 145 bbls. from sand at 3,375-85 feet. Sutter & Pyle's No. 2 Caldwell, NE cor. NW SE SW, Section 6-26-1, produced 1,045 bbls. in sand at 3,376-78 feet. Vickers Petroleum Co.'s No. 2 Nissen, SW cor. NE SW, Section 6-26-1, was completed for 750 bbls. in sand at 3,381-84 feet. No. 1 Nissen, SW cor. NE SW, Section 6-26-1, made 740 bbls in sand at 3,379-82 feet.

Tidal Oil Co.'s No. 1 Scherger, SE cor. SW NW, Section 6-26-1, has been completed for 275 bbls. in sand at 3,372-78 feet. White Eagle Oil & Refining Co.'s No. 1 Baylor, SW cor. NW NW, Section 6-26-1, made 350 bbls. in sand

at 3,391-92½ feet. Bu-Vi-Bar Petroleum Corp.'s No. 1 Shawver, NE cor. NW, Section 7-26-1, flowed 1,800 bbls. from sand at 3,358-65 feet. Skelly Oil Co. and Davis and others' No. 5 Wilson, NE cor. SE NE, Section 1-26-1w, was completed for 1,120 bbls. in sand at 3,388-92½ feet.

Russell County

Mid-West Exploration Co.'s No. 31 Austin, SW cor. Section 30-12-15w, has been completed for 150 bbls. in sand at 3,055-89 feet. Empire Oil & Refining Co.'s No. 1 Polyen, NE cor. NW SE, Section 31-13-15w, made 100 bbls. from sand at 3,333-35 feet. Mid-West Exploration Co.'s No. 22 Baxter, NW cor. SE SW, Section 32-13-15w, was completed for 75 bbls. in sand at 3,039-74 feet. No. 22 Dortland, NW cor. SE SE, Section 5-14-15w, made 30 bbls. from sand at 3,046-96 feet.

OKLAHOMA FIELDS

(Continued from Page 56)

the first day and was drilling deeper to the Quinn-Lyons sand as it is an offset to the Prairie's well.

McCulloch Oil Co.'s No. 1 Hollis, in the SE cor. NW, Section 16-10-6e, north of the Searight Pool, is a failure in the Hunton lime where it found a hole full of water. The total depth was 4,317 feet. It was the intention to plug back and test some shallow horizon.

Magnolia Petroleum Co.'s No. 1 Latimer, SE cor. SW NW, Section 17-7-4, which made a producer in the Simpson a few weeks ago with an initial production of better than 2,000 bbls. made 751 bbls. of oil on April 19. It was cutting 4 per cent. The well is 1½ miles northeast of the old Pearson Switch Pool.

Seminole Drilling Operations

Following is a summary of drilling operations in the Greater Seminole Field:

Pool—	Locations	Rigs	Inactive	Drlg. less 2,000 ft.	Drlg. 2,000-3,099 ft.	Drlg. 3,100-3,700 ft.	Drlg. below 3,700 ft.	Grand total
Little River	1	3	2	5	4	6	7	26
Carr City	0	1	1	2	3	1	9	16
Maud	1	2	5	0	2	6	29	40
Mission	0	2	7	0	1	4	41	48
Bowlegs	0	0	1	0	1	0	1	2
Earlsboro	1	6	5	3	3	1	19	33
Seminole	0	0	0	0	0	0	0	0
Searight	0	0	1	2	1	0	7	10
Total	3	14	22	12	15	18	113	175

The 175 drilling operations in Seminole area show a decline of 47 from two weeks ago, indicating that proration is having its effect. A recapitulation of producing wells in the same area shows production is declining:

Pool—	Wells on air or gas	Wells pump.	Wells flowing	Wells swabbing	Wells off	Wells show. water	Wells prod.	Total daily average prod.
Little River	150	115	6	29	26	113	326	73,612
Carr City	18	4	3	1	4	2	30	9,565
Maud	2	22	46	21	8	5	99	14,537
Mission	47	16	....	11	5	15	78	23,831
Bowlegs	55	229	....	1	22	116	307	33,966
Earlsboro	65	180	15	24	18	226	302	62,199
Seminole	15	249	3	3	6	113	276	33,130
Searight	12	41	9	1	8	37	71	8,584
St. Louis	66	192	39	19	23	173	343	127,192
Total	430	1,048	121	110	120	800	1,833	386,616

Tidal Has Interesting Well

The Tidal Oil Co.-Gardner Petroleum Co. and others' well, No. 1 Davis, in the C SE SE, Section 31-5-2e, southeastern McClain County, is a likely looking wildcat and is getting to a depth that is making it interesting. The top of the Viola lime was at 3,989 feet which is considered by some geologists as running high and indicating that the deeper formations may carry oil. The well set 8-inch casing at 3,994 feet and is rigging up standard tools. It will be shut down 10 days waiting for the cement to set.

The Independent Oil & Gas Co.'s failure in the SW cor. SW, Section 31-10-6, halts the producing area in that direction. The location was expected to extend the pool. The finding of water in the Wilcox sand in the test has caused a number of wells to be shut down in this northeast extension of the Earlsboro Pool. The well, Independent's No. 2 Alexader, found the sand at 4,401-07 feet. The same company's No. 1 Alexander in the SE cor. SW, Section 31-10-6, is shut down at 4,390 feet.

An interesting well that the Indian Territory Illuminating Oil Co. and others are drilling in the SW cor. NE SE, Section 3-7-5, Seminole County, No. 1 Factor, is known as a community test, as all the adjoining leaseholders are helping in the testing out of this acreage by pooling their interests.

Carter County

Gypsy Oil Co.'s No. 2 M. Morris, CSL NW SW, Section 28-2s-3w, is drilling at 1,910 feet.

Cotton County

Steve Linsen's No. 1 Lawler, NW cor. NE NW, Section 14-2s-11w, has drilled deeper from 1,998 feet to 2,016 feet and shut down. Cooper & Badgett made location for No. 1 Wilson, SE cor. NW, Section 15-2s-11w. Silurian Oil Co.'s No. 5 Chambers, SW cor. NW SE NW, Section 2-2s-10w, is drilling at 1,950 feet. Lawton Oil Corp.'s No. 2 Sanders, SE cor. NW, Section 3-2s-10w, is drilling deeper at 2,250 feet.

Shasta Oil Co.'s No. 1 Indian, NE cor. Section 34-1s-11w, is dry and abandoned at 2,606 feet. Everetts Oil Co.'s No. 1 Hall, SE cor. NW, Section 36-4s-13w, has been abandoned at 2,501 feet.

Creek County

Magnolia Petroleum Co.'s No. 7 Dix, CEL SE SE, Section 32-18-7, is cleaning out to deepen from 1,497 feet. O. M. Irelan and others' No. 1-A Smith, CEL SW SE, Section 11-17-10, is spudding. Ed O'Rourke and others made location for No. 1 Hunts, NW cor. SW SE, Section 16-16-10. Thomas B. Slick Oil Co. has the rig on the ground for No. 1 Cress, NW cor. SE, Section 16-16-10. Kawfield Oil Co. is repairing the rig to deepen No. 7 Snelling, CEL SW NE, Section 9-15-10, which is at 1,650 feet.

C. A. Cole and others' No. 1 Hull, NW cor. SE SE, Section 32-18-11, is dry and abandoned at 1,940 feet. Thompson & Black's No. 2 Wilson, NW cor. SW, Section 16-17-11, has been abandoned at 2,225 feet. Carter Oil Co.'s No. 2 Durant, NW cor. NE NE, Section 18-16-9, made 171 bbls. from sand at 3,033 feet.

The Prairie Oil & Gas Co.'s No. 5 Hammer, SE cor. NW, Section 5-16-8, was deepened to Wilcox sand at 3,552-57 feet and made 23 bbls. Paraffin Oil Co. and Reliance Oil Co.'s No. 1 Cumsey, NE cor. SW SW, Section 16-16-12, has been abandoned at 2,772 feet. Flynn & Morgan's No. 1 Clark, NW cor. NE SW, Section 17-14-8, is dry and abandoned at 4,050 feet.

Grant County

R. A. Gibson's No. 1 Gibson, C N half SW, Section 7-28-1, has been abandoned at 2,250 feet.

Hughes County

The Prairie Oil & Gas Co. and T. B. Slick made location for No. 1 Deer, SW cor. SW NW, Section 4-8-9.

The Texas Company has the rig on the ground for No. 1 Bryant, SE cor. NE SW, Section 9-6-8. Fuhrman & Newman's No. 2 Buck, C SW SW, Section 21-9-10, was completed for 8,250,000 feet of gas in sand at 2,655-62 feet. Sunray Oil Co.'s No. 1 S. Nitchey, SW cor. NW NE, Section 19-5-8, Allen Pool, made 492 bbls. from Cromwell sand at 2,555-2,623 feet. Westheimer & Daube's No. 2 Patterson, NW cor. Section 29-5-8, swabbed 135 bbls. from sand at 2,568-78 feet.

Jefferson County

Lesh & McCall made location for No. 1 Moore, SW cor. SE NE NE, Section 13-2s-8w.

Kay County

Marland Oil Co.'s No. 1 Shimp, C NE NE, Section 18-29-1, has been abandoned at 3,541 feet. Harris & Haun's No. 1 School Land, C N half NE, Section 36-28-1w, was completed for 150,000 feet of gas in lime at 952 feet. C. A. Leonard and others' No. 2 Smith, SW cor. NE, Section 28-27-1, made 250,000 feet of gas in sand at 840-90 feet.

Kiowa County

H. S. Christian has the rig material on the location for No. 1 Stone, SE cor. Section 18-7-18w. E. M. Boring has a spudder on the location for No. 1 Suhren, SE cor. NW SE NE, Section 22-6-16w. S. B. Cloys' No. 1 Brazil, NW cor. NE, Section 33-7-17w, has been abandoned at 1,026 feet. Stahl & Burris' No. 1 Ditmar, NW cor. SE SE, Section 18-6-16w, made 8 bbls. from sand at 445-48 feet.

Marshall County

Jordan and others' No. 1 Penn Mutual Life, NE cor. NW SE, Section 17-5s-5, is drilling at 200 feet. J. L. Dixon's No. 1 Woody, SE cor. NE NW SE, Section 20-5s-5, drilled 20 feet and was abandoned.

McClain County

Mid-Continent Petroleum Corp.'s No. 1 James, SE cor. Section 22-5-3, is dry and abandoned at 3,492 feet.

Muskogee County

Cook & Day's No. 1 L. Fields, CSL N half N half S half, Section 9-15-18, is rigging up. Decius & Garrett's No. 1-A Washington, NE cor. NW, Section 18-14-18, is a machine. M. S. Mussellem's No. 1 McCullough, SW cor. Section 34-14-19, is rigging up. H. E. Williams' No. 1-A Monday, CNL SE NE, Section 17-15-17, is dry and abandoned at 1,450 feet.

Noble County

The Prairie Oil & Gas Co. and T. B. Slick made location for No. 1 Waltermire, SW cor. NE, Section 33-21-1w.

Oklahoma County

Shell Petroleum Corp. has the cellar dug for No. 2 Petty, SW cor. NE, Section 30-11-2w, Oklahoma City area.

Okfuskee County

C. L. McMahon & Carey's rig is up for No. 1 Sproleder, NE cor. SW SE, Section 29-12-10. W. L. Umbrum has a machine on the location for No. 8 Simmer, SE cor. NE NE, Section 11-10-11. W. L. Umbrum has the rig up for No. 2 Hildebrandt, C NE SE, Section 12-10-11. Tidal Oil Co. made location for No. 1 Brown, NE cor. SW, Section 22-10-11.

Barnsdall Oil Co.'s No. 1 Barnett, SE cor. NE SE, Section 24-11-10, is a dry hole at 2,472 feet. W. L. Umbrum and Atlantic Oil Producing Co.'s No. 7 Tiger, CSL SE NW, Section 2-10-11, made a 20-bbl. well in sand at 1,703-18 feet.

Okmulgee County

Kirkland and Mid-Continent Petroleum Corp.'s rig is up for No. 1 Barnett, NE cor. SE SE, Section 18-15-13. J. E. Wallace's No. 6 Colbert, NW cor. SW NE, Section 14-14-14, is drilling at 800 feet. McClain & Miller's No. 1-A Stewart, NE cor. NW SW, Section 24-14-14, is drilling at 255 feet. Chief Drilling Co. is repairing the rig for No. 1 Smith, NE cor. SW, Section 17-13-11, to deepen. Kirkland & Son's No. 1-A Prince, NE cor. NW NW, Section 20-15-13, made 12 bbls. in sand at 1,470-1,554 feet.

Osage County

Oklahoma Natural Gas Co. moved a machine in for No. 788, NE cor. Section 15-21-10. Carter Oil Co. made location for No. 1, SE cor. SW NW, Section 34-26-6. Winona Oil Co.'s No. 2, NW cor. SW SW, Section 27-24-10, is rigging up to deepen from 1,655 feet. Devonian Oil Co. and Billingslea's No. 2, CEL NW, Section 6-23-9, is a machine. Indian Territory Illuminating Oil Co. has a machine on the location for No. 2, SW cor. NE SW SW, Section 28-23-9. Fields & Potts' No. 3, SW cor. NE NW, Section 30-23-12, is rigging up to deepen from 1,754 feet.

Kewanee Oil & Gas Co.'s No. 9, NE cor. NW SE, Section 34-27-6, Burbank Pool, made 10 bbls. from Burbank sand at 2,776-2,838 feet. Carter Oil Co.'s No. 1, SE cor. NE, Section 33-26-6, is dry and abandoned at 3,221 feet. No. 3, SE cor. NE SE, Section 33-26-6, has been abandoned at 3,065 feet. No. 2, SW cor. NW SW, Section 34-26-6, is a dry hole at 3,052 feet.

Tidal Oil Co.'s No. 1, SW cor. SE, Section 24-24-8, made 5 bbls. in Bartlesville sand at 2,120-61 feet. Peters Petroleum Corp's No. 2, NW cor. SW, Section 28-24-9, is dry and abandoned at 2,400 feet. Nath Jones and others' No. 1, SW cor. SE, Section 28-23-9, has been abandoned at 482 feet. Harry McGill's No. 1, SW cor. SE, Section 8-22-8, is a dry hole at 3,128 feet. W. C. Elliott's No. 1, SE cor. NE SE, Section 33-22-11, made 40 bbls. in Wilcox sand at 2,034-2,119 feet. The Prairie Oil & Gas Co.'s No. 4, NE cor. SE SW, Section 30-25-8, made 180 bbls. in sand at 2,366-99 feet.

Pawnee County

Nadine Oil Co.'s No. 1 James, NW cor. NE, Section 7-20-7, is spudding. McMann and others' No. 1 Smith, NW cor. NE, Section 34-20-9, is spudding.

Pottawatomie County

Continental Oil Co. made location for No. 1 Light, NE cor. SE SE, Section 18-7-4, Pearson Pool. Gypsy Oil Co.'s No. 1 LeClair, NW cor. SW SE, Section 23-7-4, St. Louis Pool, is rigging up to deepen from 4,178 feet to Wilcox sand. No. 2 LeClair, NE cor. SW SE, Section 23-7-4, is rigging up to deepen from 4,124 feet to Wilcox sand. Phillips Petroleum Co.'s No. 1 Lydick, SE cor. NE, Section 24-7-4, is drilling deeper at 4,211 feet. Gypsy Oil Co. has the cellar dug for No. 4 Rosemand, NW cor. NE, Section 26-7-4. The Prairie Oil & Gas Co. and T. B. Slick's No. 1 Laster, NE cor. SE NE, Section 19-6-4, is a rig being built.

Gypsy Oil Co.'s No. 1 Hartman, NE cor. NW NE, Section 12-8-4, Maud area, has been abandoned at 4,635 feet in Wilcox sand. Amerada Petroleum Corp.'s No. 3 Fehlig, NW cor. NE, Section 7-8-5, is a dry hole at 4,172 feet in Sylvan shale. The Texas Company's No. 2 Calvin, NW cor. SE, Section 7-8-5, Maud Pool, made 600 bbls. from Simpson sand at 4,268-4,311 feet. No. 7 Calvin, SW cor. SE SE, Section 7-8-5, swabbed 265 bbls. from sand at 4,307-08 feet.

Magnolia Petroleum Co.'s No. 4 Billington, NW cor. SE SW, Section 8-8-5, swabbed 45 bbls. in Simpson sand at 4,503-45 feet. W. B. Pine's No. 1 Linger, SW cor. NE, Section 18-8-5, was completed for 230 bbls. in Smipson sand at 4,140-42 feet. Skelly Oil Co. and Margay Oil Co.'s No. 4 Linger, SE cor. NW NE, Section 18-8-5, produced 200 bbls. in Hunton lime at 4,128-29 feet. Mid-Continent Petroleum Corp.'s No. 2 Shelton, NW cor. NE NE, Section 18-8-5, is dry and abandoned at 4,507 feet in Wilcox sand. Phillips Petroleum Co.'s No. 5 Hudson, NE cor. NW NW, Section 19-8-5, produced 225 bbls. in Hunton lime at 4,188-4,223 feet. Pure Oil Co.'s No. 1 Urbanskey, NW cor. SW NE, Section 19-8-5, swabbed 76 bbls. in Hunton lime at 4,339-55 feet.

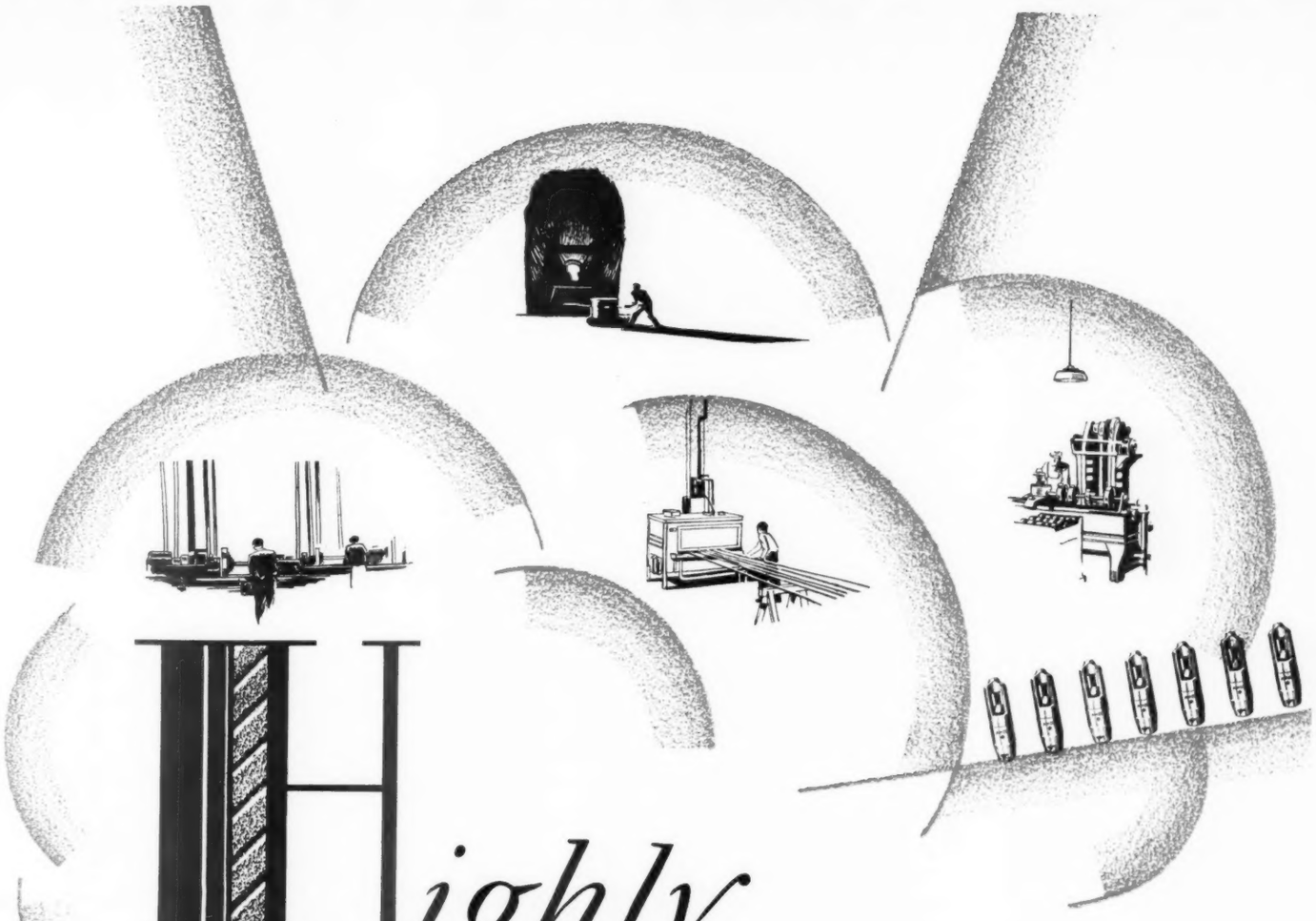
Continental Oil Co.'s No. 1 Neghnguit, SE cor. NW, Section 19-7-4, St. Louis Pool, is dry and abandoned at 4,532 feet in Simpson sand. Sinclair Oil & Gas Co.'s No. 1 Blandin, NW cor. SW, Section 24-7-4, made 30 bbls. at 4,162 feet in Simpson after plugging back from 4,277 feet in Wilcox sand. No. 2 Brandenburg, SE cor. SW, Section 7-7-5, swabbed 515 bbls. from Simpson sand at 4,112 feet after plugging back from 4,140 feet in Wilcox sand. Magnolia Petroleum Co.'s No. 2 Brandenburg, NE cor. NW NW, Section 18-7-5, was completed for 600 bbls. in Wilcox sand at 4,156-58 feet. Sinclair Oil & Gas Co.'s No. 6 Nesbit, SW cor. NE NE, NW, Section 18-7-5, made 440 bbls. in Wilcox sand at 4,106-22 feet.

Roger Mills County

Bucy & Stone made location for No. 1 Williams, C SW, Section 23-12-24w.

Seminole County

Empire Oil & Refining Co. and Marland Oil Co. made location for No. 3 Anderson, NW cor. SE SW, Section 13-9-5, Earlsboro Pool. J. S. Cosden made location for No. 3 Anderson, SE cor. NW SW, Section 13-9-5. Magnolia Petroleum Co. made location for No. 1



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AXELSON OIL WELL PUMPS AND SUCKER RODS

Sarkeys, SW cor. NE NW, Section 8-9-6. Carter Oil Co. staked location for No. 1 Sanford, NW cor. SE, Section 16-9-6. Magnolia Petroleum Co. made location for No. 1 Anderson, SW cor. SE NE, Section 18-9-6. The rig is on the ground for No. 2 A. Anderson, SE cor. SW NE, Section 18-9-6. The Prairie Oil & Gas Co. and T. B. Slick made location for No. 9 D. Campbell, SE cor. NW NE, Section 6-9-6.

Gypsy Oil Co. moved the rig in for No. 1 Payne, NW cor. NE SE, Section 18-9-6. Blackwell Oil & Gas Co. and Fisher Oil Co.'s No. 1 Jonah, SW cor. NE, Section 15-9-7, is a rig on the ground. McCulloch Oil Co. is erecting the rig to deepen No. 1 Coody, SE cor. SW SE, Section 18-9-7. Magnolia Petroleum Co. has the rig on the ground for No. 3 fee, SE cor. NW NE, Section 11-8-5, Carr City Pool. No. 1 Reed, NE cor. SW, Section 4-8-7, is a rig on the ground. Location has been made for No. 1 Wood, SE cor. Section 28-7-6, Little River Pool.

Carter Oil Co. has the cellar dug for No. 1 Davis, NE cor. SE SW, Section 7-6-8. The Prairie Oil & Gas Co. and T. B. Slick made location for No. 1 Carr, NW cor. NE NW, Section 9-7-7. The Prairie Oil & Gas Co. made location for No. 1 Raitman, SE cor. SE NW, Section 18-9-6. Location was also made for No. 1 Holman, NW cor. SE NE, Section 26-7-6, Little River Pool. Signal Oil Co.'s No. 1 Bond, SW cor. NE, Section 13-6-7, is rigging up. Indian Territory Illuminating Oil Co. is building the rig for No. 1 Porter, NE cor. Section 24-6-7.

Burke Greis Oil Co.'s No. 1 Cyrus, SE cor. NE NW, Section 13-9-7, is dry and abandoned at 4,263 feet. Carter Oil Co.'s No. 1 Coker, SE cor. SW, Section 2-8-5, Carr City Pool, made 3,735 bbls. from Wilcox sand at 4,293-97 feet. Gypsy Oil Co.'s No. 3 Doser, SW cor. NE NE, Section 7-8-6, made 295 bbls. from Wilcox sand at 4,246-51 feet. Marland Oil Co.'s No. 3 Maines, SE cor. SW, Section 7-8-6, Mission Pool, swabbed 61 bbls. from Wilcox sand at 4,406-29 feet.

Marland Oil Co.'s No. 1 Lacke, SE cor. NE SW, Section 32-8-7, has been abandoned at 4,590 feet in Wilcox sand. Magnolia Petroleum Co.'s No. 1 Glass, SW cor. NE NE, Section 26-7-6, has been completed for 25,000,000 feet of gas in Gilcrease sand at 3,123-36 feet. Carter Oil Co.'s No. 1 Factor, SE cor. NW, Section 26-7-6, is dry and abandoned at 4,206 feet in Wilcox sand. The Prairie Oil & Gas Co. and T. B. Slick's No. 1 Mulcussy, SW cor. SE NE, Section 4-7-7, is dry and abandoned in Wilcox sand at 4,432-40 feet.

The Prairie Oil & Gas Co.'s No. 7 Billington, NW cor. SE NW, Section 11-8-5, Carr City Pool, was completed for 940 bbls. in Wilcox sand at 4,226-33 feet. The Prairie Oil & Gas Co. and T. B. Slick's No. 6 D. Campbell, NW cor. SE NW, Section 6-9-6, Earlsboro Pool, was completed in Wilcox sand at 4,357-71 feet for 15 bbls. an hour. The Prairie Oil & Gas Co.'s No. 4 Baker, SE cor. NW NE, Section 24-9-5, made 370 bbls. in Simpson sand at 4,148-49 feet.

Stephens County

Smythe and others' No. 1 Shaw, C NE NE, Section 27-2-8w, is a rig. Magnolia Petroleum Co. made location for No. 24 Kagay, SW cor. SE SW, Section 34-1s-8w. Wirt Franklin Petroleum Corp.'s No. 2 Brake "B," SW cor. NW NE, Section 12-1s-4w. Pace and Texhoma Oil Co.'s No. 2 Houston, SW cor. NE NE SW, Section 2-2s-8w.

Magnolia Petroleum Co.'s No. 7 Thomas, SW cor. SE SE, Section 25-1-9w, is dry and abandoned at 2,285 feet. Fossett and others' No. 3 Adams, SW cor. NW NW SW, Section 19-1s-8w, is a dry hole at 1,531 feet. Magnolia Petroleum Co.'s No. 21 Kagay, NW cor. SE SE SW, Section 34-1s-8w, is pumping 65 bbls. from sand at 1,633-45 feet. Clark & Cowden's No. 3 Davidson, NW cor. SW SW, Section 13-1s-4w, was completed for 59 bbls. in sand at 2,980-86 feet.

Tulsa County

Hoss & Glidden's No. 2 Hawkins, SE cor. NW SW, Section 18-19-12, is drilling at 1,800 feet.

Wagoner County

W. C. Newman has a machine on the location for No. 2 Bruner, NW cor. SW, Section 18-17-17. Chicago Drilling Syndicate's No. 2 J. Barnes, CEL NW NE, Section 13-16-17, is dry and abandoned at 438 feet.

Production of St. Louis Pool

Production of St. Louis Pool by companies and leases for April 18, follows:

Company, farm—	Location	Wells	Prod.
Barnsdall:			
Stahl	30-7-5	3	691
Blackwell-Omar:			
Cherry	25-7-4	3	685
Darby:			
Youngblood	16-7-4	1	532
Empire:			
School Land	36-7-4	1	190
Gypsy:			
Bruno	25-7-4	4	82
Collins	25-7-4	4	307
Dodson	26-7-4	4	275
LeClair	23-7-4	4	3,845
Roseman	26-7-4	3	1,272
Stahl	30-7-5	8	5,930
Home Gas:			
Town Lot	14-7-4	1	404
Independent:			
Blandin	30-7-5	5	660
Youts	19-7-5	8	12,090
Indep.-Darby:			
Freid	23-7-4	2	110
LeClair	23-7-4	3	95
I.T.I.O.-Sinclair:			
Woodward	18-7-5	1	70
Inter-Ocean:			
Coley	24-7-4	1	27
McGee	23-7-4	6	350
Magnolia:			
Brandenberg	18-7-5	3	1,680
Cherry-A	26-7-4	5	1,563
Cherry-B	26-7-4	3	297
G. W. Fyke	29-7-5	1	1,333
G. W. Fyke-B	29-7-5	2	653
Tull Fyke-A	29-7-5	1	91
Tull-Fyke-B	29-7-5	2	2,627
Tull-Fyke-D	29-7-5	2	218
Hembree	19-7-5	4	1,914
Nicholas	31-7-5	2	85
Pugh	7-7-5	1	0
J. M. Robbins	15-7-4	4	218
S. A. Wilborn	24-7-4	5	803
Chas. Youts	20-7-5	4	606
C. A. Youts	19-7-5	4	404
H. E. Youts	20-7-5	7	8,325
McCullough-Blackwell:			
Bruno	25-7-4	5	1,084
McCullough-Mid.-Cont.:			
Smith	25-7-4	6	815
Mid-Kansas:			
Getzleman	25-7-4	4	1,405
Lunay	30-7-5	3	340
Minnehoma:			
Sims	16-7-4	1	65
Packard Oil:			
Church	29-7-5	1	150
Panther:			
Town Lot 14 &	23-7-4	2	75
Phillips:			
Cherry	25-7-4	2	160
Tydick	24-7-4	1	0
Stahl	30-7-5	4	1,060
Prairie:			
Desmond	25-7-4	4	240
Ellison	25-7-4	1	540
Gammon	30-7-5	8	3,855
Hembree	19-7-5	4	7,540
Linn	30-7-5	4	715
Pugh	7-7-5	1	0
Ramsey	18-7-5	1	0
Rhodd	18-7-5	1	0
Wolfe	29-7-5	4	3,050
Youts	18-7-5	4	320
Prairie et al:			
Davis	18-7-5	4	500
Prairie:			
Nesbit	18-7-5	2	480
Pure:			
Dodson	26-7-4	2	178
Thomas	26-7-4	4	13,418
Thrailkill	19-7-5	1	122
Shaffer:			
Cherry	23-7-4	4	296
Tolon	30-7-5	4	712
Shell:			
Smith	21-7-5	1	110
Sinclair:			
Blandin	24-7-4	13	1,710
Brandenberg	7-7-5	3	2,665
Bruno	26-7-4	2	5,770
Gilbreath	25-7-4	2	845
Nadash	29-7-5	5	529
Nealy	25-7-4	5	430
Nealy-B	25-7-4	2	263
Nesbit	18-7-5	6	5,275
O'Kitchee	19-7-5	7	416
Texas:			
Cherry	25-7-4	4	3,320
Tidal:			
Smith	26-7-4	1	120
Westheimer-Daube:			
Freid	24-7-4	5	1,015
Small pumpers		89	2,083
Total		340	108,104

Seminole Production

Production of pools in the Seminole area by companies and leases for April 18 follows:

Little River Pool

Company, farm—	Location	Wells	Prod.
Amerada:			
Nitey	2-7-6	3	585
Amerada-Wilcox:			
Fore	35-8-6	2	640
Barnsdall:			
Cotcha	23-7-6	2	455
Hotulke	22-7-6	3	180
Walker	4-7-6	1	40
Blackwell:			
Baker	11-7-6	4	1,255
Nitey	35-8-6	5	550
Talley	14-7-6	4	640
Bryan & Emery:			
Walker	4-7-6	1	13
Carter:			
Cotcha, M.	23-7-6	3	115
Cudjo, L.	23-7-6	2	120
Fish	36-8-6	4	610
Harjo, C.	11-7-6	2	2,020
Harjo, M.	13-7-6	4	1,380
Jackson	11-7-6	4	1,045
Larney	24-7-6	4	1,920
Lena	10-7-6	1	705
Moore	11-7-6	2	325
Tewee	14-7-6	6	965
Thomas	11-7-6	1	480
Wilson	12-7-6	1	230
Champlin:			
Tewee	14-7-6	2	744
Continental:			
Cosar	36-8-6	7	1,007
Cosar, M.	25-8-6	1	431
Continental & Fisher:			
Milsey	11-7-6	2	524
Empire:			
Charty	24-7-6	1	69
Coker	13-7-6	2	570
Sandlin	3-7-6	1	15
Gypsy:			
Brown, C.	33-8-6	2	485
Brown, M.	33-8-6	1	800
Campbell	33-7-6	2	15
Conard	22-7-6	2	422
Cosar, W.	36-8-6	2	180
Cotcha	23-7-6	8	3,250
Denmark	11-7-6	4	1,526
Hulhoke	14-7-6	10	1,227
Mungee	1-7-6	1	5
Payne	5-7-7	1	0
Pottie	35-8-6	4	952
Renton	11-7-6	3	180
Independent:			
Carpenter	27-7-6	1	1,507
Davis, R.	13-7-6	4	1,780
Tewee	14-7-6	6	1,014
Williams	15-7-6	1	760
Independent & Highway:			
Harris	23-7-6	8	1,233
Independent & White Eagle:			
Davis	2-7-6	1	490
I.T.I.O.:			
Campbell	1-7-6	1	139
Dungan	35-8-6	3	398
House, M. A.	1-7-6	1	10
House, W. E.	1-7-6	1	11
House-B	2-7-6	4	700
Hull	26-8-6	3	172
Jackson	1-7-6	3	964
McCulla	1-7-6	3	771
Nitey	2-7-6	6	155
Phoebe-A	36-8-6	2	49
Phoebe-B	36-8-6	3	77
Reed	1-7-6	1	9
Sokethechе	1-7-6	3	377
Magnolia:			
Cruse	2-7-6	1	225
Denby	11-7-6	4	328
Harjo, A.	14-7-6	2	40
Harjo, B.	14-7-6	2	328
Pottie	35-8-6	1	164
Reed, E.	31-8-7	1	28
Reed, I.	22-7-6	3	504
Marland & Shaffer:			
Harrison	4-7-7	1	387
McCulloch & Sands:			
Harrison	1-7-6	1	10
Mid-Continent:			
Brunner	11-7-6	1	150
Eleck	23-7-6	1	60
Smith	5-7-7	3	3,800
Wadsworth	36-8-6	7	340
W. B. Pine:			
Hoyecha	26-8-6	7	1,389
Pine-Phillips:			
Pottie	35-8-6	1	198
Prairie:			
Chilcoat	25-8-6	3	553
Dungan	35-8-6	1	5
Gibson	14-7-6	5	1,460
Harris	14-7-6	4	805
House	2-7-6	1	160
Johnson	24-7-6	1	685
Lustey	5-7-7	2	120
Moppin	24-7-6	2	555
Reed	13-7-6	2	1,000
Talley	14-7-6	4	885
Williams	15-7-6	2	735
Wood	26-7-6	1	250
Cudjo	26-7-6	1	245
Prairie & Amerada:			
Sunny	14-7-6	6	1,607
Prairie & Pine:			
Coker	1-7-6	1	640
Pure:			
Brinson	24-7-6	3	1,626
Cotcha	14-7-6	10	2,134
Harjo	11-7-6	4	1,130
Hollins	11-7-6	1	152
Reiter-Foster:			
Bunyard	14-7-6	4	795
Jefferson	31-7-6	1	12
Shaffer:			
Narcombe	36-8-6	2	245
Shell:			
Caesar	11-7-6	1	52
Glass	26-7-6	1	5
Hotulke	23-7-6	4	611
Jeffries	32-8-7	1	10
Johnson	13-7-6	4	2,324
Sinclair:			
Blanton	11-7-6	1	215
Cosar	36-8-6	3	880
Haney	12-7-6	1	95
Tewee	14-7-6	2	1,050
Sinclair & Kingwood:			
Pompey	24-7-6	1	115
Skelly:			
Carl	14-7-6	2	1,791
Snowden-McSweeney:			
Tiger	13-7-6	2	615
Superior:			
Potulka	31-8-6	1	0
Sokethechе	1-7-6	1	3
Texas:			
Brooks	25-8-6	1	10
Coker	1-7-6	3	0
Janey	11-7-6	6	1,015
Texas & Independent:			
Hotulke	23-7-6	4	1,270
Hotulke	22-7-6	2	2,130
Tidal:			
House	1-7-6	2	205
Johnson	1-7-6	1	31
Twin State:			
Lowe	25-8-6	1	30
Total		327	72,924

Carr City Pool

Company, farm—	Location	Wells	Prod.
Barnsdall:			
Coker	11-8-5	6	3,723
Fife	14-8-5	2	295
Carter:			
Coker	2-8-5	1	2,265
Empire:			
Cluck	11-8-5	4	4,097
Gypsy:			
Coker	10-8-5	1	0
Fife	14-8-5	1	12
I.T.I.O.:			
Simpson	10-8-5	1	0
Tully	10-8-5	1	0
Magnolia:			
Killing	14-8-5	1	11
Prairie:			
Billington	11-8-5	7	2,745
Mitchell	15-8-5	1	700
Sinclair:			
Bean	11-8-5	2	945
Harjo	11-8-5	2	588
Total		31	14,841

Maud Pool

Company, farm—	Location	Wells	Prod.
Amerada:			
Ballard	1-8-4	1	165
Fehlig	7-8-5	1	89
Gossland	8-8-5	3	325
Gravel	1-8-4	1	15
Hallum	1-8-4	4	2,470
Amerada & Barnsdall:			
Wallace	17-8-5	2	230
Barnsdall & Hull:			
Green	20-8-5	1	365
Darby:			
Ketcham	19-8-5	1	5
Gypsy:			
Bourassa	7-8-5	4	86
Miller	18-8-5	7	1,282
Independent:			
Harding	18-8-5	5	630
I.T.I.O.:			
State	16-8-5	1	0
Laurel O.&G.:			
Billington	18-8-5	3	350
Magnolia:			
Billington	8-8-5	3	50
Green	20-8-5	1	523
Marland & Shell:			
Everett	18-8-5	1	264
Mid-Continent:			
Shelton	18-8-5	1	100
Phillips:			
Hudson	19-8-5	4	322
Wallace	17-8-5	1	0
Pine:			
Lingefel	18-8-5	1	0
Prairie:			
Campbell	18-8-5	7	420
Prairie and White Eagle:			
Villines	20-8-5	1	0
Pure:			
Lindly	18-8-5	8	266
Urbansky	19-8-5	2	189
Wiley	8-8-5	4	1,959
Sinclair:			
Bellars	19-8-5	10	1,170
Calvin	7-8-5	1	120
Lewis	6-8-5	2	135
Skelly & Lenox:			
Green	30-8-5	1	453
Skelly & Margay:			
Lingefelt	18-8-5	4	0
Texas:			
Calvin	7-8-5	7	595
Tidal:			
Dunn	12-8-4	1	65
Everett	18-8-5	1	65
Smith	8-8-5	1	200
Twin State:			
Calvin	7-8-5	2	300
Wilcox:			
Smith	8-8-5	3	1,188
Total		102	14,247

Mission Pool

Company, farm—	Location	Wells	Prod.
Amerada:			
Rice	5-8-6	2	1,130
Carter:			
Fuswa	18-8-6	2	1,390
Melisse	9-8-6	1	890
Micco	8-8-6	2	180
Darby:			
Judy	1-8-5	1	105
Gypsy:			
Baby	6-8-6	1	15
Barkus, N.	6-8-6	6	3,972
Barkus, S.	7-8-6	1	35
Dosar	7-8-6	4	1,455
Hardy	7-8-6	4	165
Harjoche	7-8-6	3	200
Micco, L.	8-8-6	2	75
Micco, S.	8-8-6	1	127
Mission	5&6-8-6	5	2,198
Mosar	1-8-5	3	765
Independent:			
Lawson	1-8-5	4	2,347
Independent & Kistler:			
Payne	7-8-6	2	2,890
Marland:			
Maines	7-8-6	3	962
McMahon et al:			
Harjo	7-8-6	2	850
Mid-Kansas:			
Moore	7-8-6	1	60
Minnehoma:			
Neal	7-8-6	2	137
Pine:			
Harjo	6-8-6	2	706
Micco	8-8-6	1	0
Prairie:			
Melton	6-8-6	2	1,530
Micco	5-8-6	1	10
Townsend	6-8-6	1	135
Prairie & Gypsy:			
Owens	18-8-6	1	0
Shaffer:			
Weaver	12-8-5	1	177

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Lubricants for motor cars and aeroplanes

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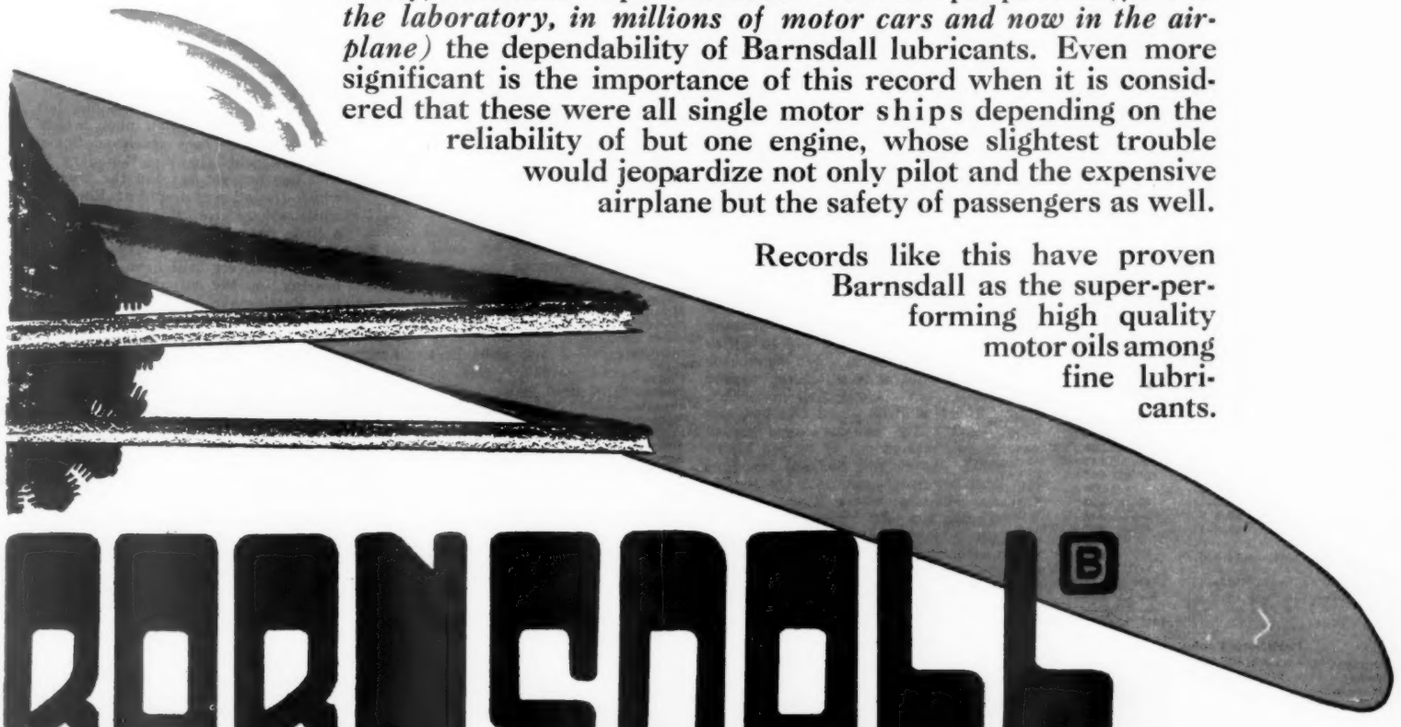

BARNSDALL

FIRST* *Refiner*

*In 1860, almost 70 years ago, William Barnsdall, father of T. N. Barnsdall, the founder of BARNSDALL, established the world's first oil refinery.

Company, farm—	Location	Wells	Prod.
Shell & Marland:			
Herndon	7-8-6	1	71
Shell & Papoose:			
Maines	7-8-6	5	1,359
Sinclair:			
Hardy	7-8-6	3	2,068
Sinclair & Lenox:			
Judy	1-8-5	1	28
Tidal:			
Nelly	12-8-5	2	537
Twin S ate:			
Hayes	8-8-6	2	1,715
July	6-8-6	2	1,379
Ripley	12-8-5	1	400
Total		81	30,516

Bowlegs Pool

Company, farm—	Location	Wells	Prod.
Amerada:			
Roscoe	15-8-6	7	875
Atlantic:			
Baker	10-8-6	4	410
Fleet	23-8-6	3	110
Grayson	13-8-6	4	467
Jones, A.	16-8-6	2	40
Jones, C.	9-8-6	1	70
Barnsdall:			
McNac	28-8-6	1	25
Murrow	11-8-6	4	320
Carter Oil:			
Bowlegs	15-8-6	4	385
Burden	23-8-6	2	175
Harjoche	14-8-6	6	580
Hilly	23-8-6	3	250
Jones	11-8-6	4	360
Walker	15-8-6	4	350
Wise	23-8-6	11	1,326
Dixie:			
Culley	11-8-6	1	68
Empire:			
Lacy	14-8-6	6	350
Wise	23-8-6	2	156
Gypsy:			
Bowlegs	22-8-6	1	5
Bradley	9-8-6	1	5
Cumsey	10-8-6	4	640
Grayson	13-8-6	4	420
Harjoche	10-8-6	3	535
Jones	11-8-6	1	3
Walker	15-8-6	7	588
Wise	23-8-6	2	135
I T.I.O.:			
Barnett	24-8-6	2	125
Barnett-B	23-8-6	1	74
Billington	22-8-6	4	236
Bowlegs	22-8-6	9	1,282
Davis	13-8-6	4	140
Fay	13-8-6	9	1,017
Goforth	15-8-6	12	1,351
Livingston	15-8-6	10	1,049
Lizzie	13-8-6	3	382
Walker	15-8-6	8	754
Williams	12-8-6	1	194
Wilmott	15-8-6	4	274
Work	24-8-6	1	41
Youngblood	24-8-6	2	99
Magnolia:			
Davis	13-8-6	3	457
Davis, M.	13-8-6	1	168
Hammond	10-8-6	8	760
Rhodos	12-8-6	5	500
Van Buskirk	9-8-6	4	540
McCulloch:			
Bowlegs	22-8-6	2	185
Mid-Continent:			
Baker	10-8-6	4	138
Smith	12-8-6	6	650
Minnehoma:			
Bowlegs	15-8-6	3	62
Prairie:			
Gahagan	23-8-6	3	305
Harber	10-8-6	8	1,720
Jones	3-8-6	1	197
Jones	11-8-6	4	305
Templeton	12-8-6	5	890
Whitney	23-8-6	4	500
Pure Oil:			
Reed	14-8-6	14	2,103
Strother-D	11&14-8-6	4	372
Strother-F	10-8-6	7	2,061
Shaffer:			
Lacy	14-8-6	3	395
Shell:			
Taylor	16-8-6	5	58
Sinclair:			
Cumsey	10-8-6	4	700
Ellen	11-8-6	6	652
Harjo	14-8-6	3	767
Jones	9-8-6	7	355
Taylor	10-8-6	4	620
Taylor, W.	10-8-6	3	283
Walker	22-8-6	4	837
Texas:			
Reed	14-8-6	11	695
Tidal:			
Grayson	13-8-6	4	415
Harjoche	10-8-6	6	960
Total		307	34,316

Earlsboro Pool

Company, farm—	Location	Wells	Prod.
Amerada:			
Anderson	15- 9-5	2	294
Cowden	4- 9-5	7	595
Rogers	3- 9-5	2	66
Atlantic & Gypsy:			
Delaware	13- 9-4	1	0
Atlantic & Sinclair:			
Foreman	18- 9-5	1	110
Barnsdall:			
Brown	10- 9-5	4	1,308
Bruner, F.	2- 9-5	2	203
Bruner, N.	10- 9-5	3	700
Cudjo	14- 9-5	1	40
Davis, D.	11- 9-5	3	410
Davis, J.	11- 9-5	4	1,093
Davis, M.	11- 9-5	2	20
Gibson	9- 9-5	7	1,202
Hern	15- 9-5	1	1
Ingram	1- 9-5	7	221
Pack, S.	10- 9-5	4	121
Peter	10- 9-5	3	67
Sango	1- 9-5	2	692
Sebalka	15- 9-5	1	201
Sullivan, H.	11- 9-5	1	3
Sull-Harjo	10- 9-5	2	20
Wasutke	12- 9-5	3	418
Burke-Greis:			
Wisner	6- 9-6	2	425
Burke-Greis & Red Bank:			
Mays	1- 9-5	2	1,235
Carter:			
Davis	13- 9-5	3	340
James	6- 9-6	3	1,390
Carter et al:			
Gilliam	13- 9-5	2	1,500
Continental:			
Kays	2- 9-5	2	92
Spencer	12- 9-5	4	796
Cosden, J. S. Inc.:			
Anderson	13- 9-5	1	3,091
Empire:			
Barker	12- 9-5	1	27
Edmondson	3- 9-5	2	45
Empire & Marland:			
Anderson	13- 9-5	1	517
Empire & Amerada:			
Bullock	8- 9-5	1	445
Gypsy:			
Bruner	10- 9-5	4	2,725
Carter, B.	11- 9-5	7	1,290
Earl	16- 9-5	1	21
Hunick	5- 9-5	2	1,655
Lottie	31-10-6	1	203
Noble	12- 9-5	4	1,105
Peter	10- 9-5	1	150
Sango	1- 9-5	13	2,685
State	16- 9-5	3	285
Independent:			
Alexander	31-10-6	1	0
Bruner	10- 9-5	3	282
Sullivan	10- 9-5	1	15
Knapp	8- 9-5	1	1,828
Indep.-Margay:			
Gains	11- 9-5	3	195
Magnolia:			
Anderson	18- 9-6	1	48
Bryant	9- 9-5	6	118
Cowden	4- 9-5	2	22
Dixon	12- 9-5	1	18
Edmondson	3- 9-5	1	4
Germany	30- 9-5	1	20
Gilliam	13- 9-5	2	5,181
Holmsley	11- 9-5	6	9
Hyde	13- 9-5	2	2,691
Ingram	10- 9-5	1	20
Lena	10- 9-5	3	48
Moore	24- 9-5	1	50
Seay	12- 9-5	9	507
Simpson	10- 9-5	1	351
Sparks	11- 9-5	6	93
Sullivan	12- 9-5	3	19
Mid-Continent:			
McCumber	9- 9-5	7	60
Rogers	3- 9-5	2	1,320
Mid-Kansas:			
Anderson	14- 9-5	1	40
Phillips:			
Dunaway	14- 9-5	1	20
Prairie:			
Baker	24- 9-5	3	90
Davis	13- 9-5	3	795
Graham, C.	3- 9-5	2	15
Graham, O.	10- 9-5	4	625
James	6- 9-6	2	0
Stidham	11- 9-5	9	1,555
Prairie & Skelly:			
Campbell	6- 9-6	5	2,671
Prairie & Whitney:			
Harjo	24- 9-5	1	27
Shaffer:			
Clark	1- 9-5	3	202
McCoy	36-10-5	1	0
Shell:			
Bayless	17- 9-5	1	17
Hearn	13- 9-5	1	102
Spencer	12- 9-5	2	1,268
Sinclair:			
Alexander	36-10-5	1	40
Foreman	18- 9-5	1	15
Hollins	12- 9-5	1	35
Sango	2- 9-5	4	1,340
Skelly:			
Mays	1- 9-5	1	1,556
Shepard	6- 9-6	4	1,718
Spencer	12- 9-5	1	157
Skelly & Atlantic:			
Cherry	6- 9-6	4	438
Lottie	6- 9-6	3	2,093
Superior:			
Ingram	1- 9-5	1	840
Walker	2- 9-5	2	1,377
Texas:			
Anderson	2- 9-5	8	70
Brown	10- 9-5	8	92
James	6- 9-6	2	210
Rogers	5- 9-5	5	1,390
Wilmott	10- 9-5	6	125
Tidal:			
Walker	35-10-5	3	1,540
Wa.kins	9- 9-5	7	1,840
Twin States:			
Barker	12- 9-5	3	45
Hern	2- 9-5	2	40
Total		302	63,095

Seminole Pool

Company, farm—	Location	Wells	Prod.
Amerada:			
Fixico	23-9-6	3	79
Killingsworth	23-9-6	4	447
Rentie	23-9-6	3	373
Atlantic:			
Cudjo, N.	35-9-6	3	405
Barnsdall:			
Carter	24-9-6	6	320
Henry	14-9-6	2	522
Jones	34-9-6	4	495
Carter Oil:			
B. Carter	24-9-6	2	40
F. Carter	23-9-6	3	95
Creamer	34-9-6	1	5
Cudjo, R.	35-9-6	4	150
Cudjo, W.	34-9-6	1	125
Gilliland	27-9-6	1	120
Grisso	23-9-6	4	180
Grisso, M.	15-9-6	1	185
Killings, G. F.	14-9-6	4	35
Killings, M. E.	23-9-6	12	3,800
Knapp	13-9-6	1	32
Lukes	27-9-6	5	855
Pounder	34-9-6	2	130
Simpson	35-9-6	2	130
Strothers	34-9-6	4	400
Vierson	23-9-6	1	2
Empire:			
Gross	25-9-6	2	15
Wilson	34-9-6	2	304
Gypsy:			
Butler	35-9-6	4	117
Carter	24-9-6	8	657
Cudjo	34-9-6	4	560
Fixico	26-9-6	7	60
Harjo	25-9-6	3	430
Wolfe	26-9-6	5	366
Independent:			
Fixico, P.	23-9-6	3	420
Harjo	25-9-6	2	67
Butler	35-9-6	3	900
Fixico, T.	26-9-6	5	390
Jones	26-9-6	1	420
I.T.I.O.:			
Allen	25-9-6	2	33
Bowlegs	26-9-6	12	2,146
Goodin	23-9-6	4	252
Harjo	23-9-6	3	46
James	24-9-6	2	113
Reed	24-9-6	1	8
Kingwood:			
Johnson	22-9-6	3	495
Magnolia:			
Boren	2-8-6	1	4
Franks	25-9-6	3	280
Mid-Continent:			
Rendle	14-9-6	9	410
Tayeche	24-9-6	7	175
Phillips:			
Strothers	27-9-6	2	75
Prairie:			
Cudjo	35-9-6	3	634
Franks	35-9-6	6	1,280
Giblet	35-9-6	3	1,380
Gross	25-9-6	5	30
Mason	36-9-6	1	65
Spencer	13-9-6	1	6
Strothers	27-9-6	8	2,170
Tiger	1-8-6	1	42
Pure Oil:			
Strothers	26-9-6	17	4,434
Strothers, B.	36-9-6	4	494
Strothers, C.	34-9-6	1	295
Shell:			
Harber	22-9-6	2	229
Lasley	22-9-6	2	39
Sinclair:			
Carter	13-9-6	2	22
Cudjo-A	35-9-6	6	512
Cudjo-B	35-9-6	4	652
Dicey	22-9-6	2	365
Fixico	23-9-6	4	475
Superior:			
Cudjo	35-9-6	1	46
Noble	15-9-6	1	2
Texas:			
Mayhue	14-9-6	1	225
Strothers	2-9-6	1	75
Tidal:			
Carter	24-9-6	4	400
Fixico	26-9-6	7	1,467
Harjo	25-9-6	1	32
Harjo, T.	23-9-6	3	50
Turman:			
Cudjo	35-9-6	4	476
Grisso	35-9-6	1	63
Jones	34-9-6	4	1,403
Total		277	35,031

Searight Pool

Company, farm—	Location	Wells	Prod.
Amerada:			
Johnson	4- 9-6	1	31
Strothers	3- 9-6	2	302
Barnsdall:			
Jackson	5- 9-6	2	26
Carter:			
Davis	4- 9-6	6	540
Frazier	3- 9-6	6	690
Kilker	2- 9-6	1	20
Mandler	3- 9-6	2	7
Scott	26-10-6	1	12
Carter, et al:			
Strothers	11- 9-6	1	1,270
Gypsy:			
Cudjo	4- 9-6	3	587
Nevins	32-10-6	1	35
Magnolia:			
Varnum	32-10-6	2	508
Mid-Continent:			
Grayson	34-10-6	4	35
Saloche	33-10-6	6	800
Mid-Continent & Homaokla:			
Nevins	32-10-6	3	1,080
Pine:			
Lula	4- 9-6	1	20
Prairie:			
Cannon	33-10-6	1	4
J. Carter	10- 9-6	1	4
Houch	33-10-6	1	3
Hurford	33-10-6	1	515
Kincaid	33-10-6	2	65
Wimer	22-10-6	1	15
Pure:			
Aldridge	3- 9-6	4	1,060
Shell:			
Strothers	3- 9-6	4	224
Sinclair:			
Polly	3- 9-6	4	1,435
Superior:			
Varnum	4- 9-6	1	0
Texas:			
Fleet	4- 9-6	1	20
Twin States:			
Varnum	4- 9-6	2	112
Wilcox:			
Chupco	4- 9-6	7	228
Total		72	9,648

ROCKY MOUNTAIN AREA

(Continued from Page 66)

Burch, C NW SW Section 19-17-30, has commenced spudding. Leonard & Levers' No. 1 Haggerty, NE cor, NW Section 18-16-30, is drilling at 3,000 feet.

In San Juan County, the Milwaukee-New Mexico Syndicate's No. 1 Beardsley, C NE Section 30-28-11, Kutz Canon district, is shut down at 1,700 feet waiting for new drilling line, and the Angel Peak Oil Co.'s No. 1 Garland, NE NE Section 11-28-11, is shut down at 3,000 feet repairing water line which was washed out by floods. The Childers Drilling & Producing Co.'s No. 2 Ute, Section 24-31-16, is waiting for repairs at 2,300 feet, and the Dorothy Oil Co.'s No. 2 Goede, Section 29-30-9, in the Blanco district, is resuming at 550 feet after being shut down for the winter.

R. R. Burke, W. H. Willey and William Mansfield are reported to have organized the Reserve Oil Co. to take over the permits of the Ohio Oil Co. on the Stony Butte structure in the southern part of San Juan County, and to drill a number of shallow wells. The Midwest Refining Co. in agreement with the Ohio Company drilled a well in the SE SE Section 36-22-14 last year which tested 30 bbls. of oil at 840-70 feet. It previously had shown some oil with water. These horizons were cased off and at 3,063 feet it was converted into a water well flowing 5,000 bbls. from the Hospah sand. The new firm will develop the shallow horizon only, it is reported.

UTAH

The Continental Oil Co.'s No. 1, Section 22-43-22, on the Boundary Butte structure in San Juan County, southeastern corner of Utah, is sharing interest equally with the same firm's No. 17 on the Rattlesnake Dome in San Juan County, New Mexico, approximately 50 miles to the southeast. This well has been showing gas for the past several hundred feet in the lower Pennsylvania and at last reports the quantity was increasing while drilling was in progress at 4,900 feet. At 4,770 feet the well was making approximately 7,000,000 feet of gas, this being the second flow of about the same quantity. The first large gas was at 4,525 feet, at which time the quantity increased to about 5,000,000 feet and was spraying some distillates. Cuttings from the two wells are being carefully analyzed to correlate the horizons as far as possible, but so far no definite decision upon which all are agreed has been reached. Some express the belief that the Boundary Butte well has not yet reached the horizon in which the oil was found at Rattlesnake, while others are of the opinion it is a little deeper. In any event, the prospects are considered very encouraging and a discovery will have an important bearing on the situation developed by the Rattlesnake well.

The Boundary Butte well commenced drilling in 1923. The Southwest Oil Co. was in charge of the operation, the Midwest Oil Co. and affiliated interests, the Kinney-Coastal Oil Co., the Mutual, (now the Continental) and others holding permits and leases. In 1924 a strike was made in the Shinarump conglomerate at 1,590 feet, the well being good for about 25 bbls. The well is in the Navajo Indian Reservation on proclamation land. Permits were issued under the leasing act and following a change in the Interior Department at Washington the Government attempted to cancel the permits. The litigation which followed was settled finally by Congress passing a measure defining the status of the Indian proclamation land and including a relief section. Drilling for the affiliated interests then was resumed with the Continental in charge. The well has been an expensive operation. It was 90 miles from a telephone, 142 miles from a railroad and in the midst of a wilderness. It was necessary to construct roads, open a coal mine, lay extensive water lines and haul water for domestic purposes 23 miles. It is a good illustration of the difficulties encountered in wildcatting in the Rocky Mountain area where the Government is now cancelling permits if drilling isn't started within 6 months. The structure is quite a large one, being about 12 miles long (L shaped) and from 2 to 4 miles wide.

Crescent Area

The Crescent Oil Syndicate's No. 1

McCarthy, SW SW Section 27-21-19, in the Crescent area in Grand County, is drilling at 1,650 feet and is believed to be just above the Dakota. The Navajo Petroleum Co.'s No. 1 State, SW SE Section 2-20-21, is the Cisco district, is bottomed at 2,860 feet and is reported to be through a 10-foot sand showing some saturation and a little gas. The oil, which was in quantities sufficient to permit taking of samples, is described as being heavy and dark green. The hole is not yet in the Dakota. The Utah Southern Oil Co.'s No. 1 King, Section 13-23-30, Salt Valley dome, is coring and drilling at 3,640 feet in black lime after passing through a thick stratum of salt. The Western Venture Corp.'s No. 1 Spahr, Section 8-5s-21, Uintah County, is drilling at around 1,000 feet, and the Phillips Petroleum Co.'s No. 1 Schick, Section 16-27-16, in Wayne County, has recovered the tools lost at 4,900 feet, and is resuming.

COLORADO

Several Colorado wells which are expected to prove up new horizons or extend the area of producing pools are at interesting depths with important results one way or the other expected at almost any time. One of these is the Texas Production Co.'s No. 4 Belle Dennis, NE SE Section 7-6n-86, on the Tow Creek Dome in Routt County, which was started a year ago to test the Sundance horizon. This horizon lies below the Dakota and Morrison formations. When oil was discovered in the Sundance on the Iles structure in Moffat County two years ago it changed the entire situation in northwestern Colorado as the Dakota had been the principal objective prior to that time. The Tow Creek structure has been producing from the shale above the Dakota for several years but tests to the Dakota yielded nothing but water. The Belle Dennis is the first well to explore the Morrison and Sundance. Official reports are to the effect that the hole is bottomed at 4,268 feet, but beyond that meager statement the company is not giving out any information. However, from other sources comes the reports that an important discovery is imminent and that the company has been making tests of the horizon in which the hole is now bottomed. A water sand was encountered a little below 4,000 feet which probably was the Dakota. If that is correct, then the hole probably is in the Morrison. The water flow at 4,080 feet was quite heavy and at that depth a rotary was installed to mud it off and the rotary drill has since been used. The source of the shale oil in this pool has been a mystery for some time and the next few days may disclose whether it has migrated from the lower horizons, in which event a new sand pool is probable.

The Texas Production Co. also has several other wells at interesting stages. Its No. 36 Lloyd, SE cor. Section 21-4n-92, on the southwestern side of the Iles Dome and half a mile away from the nearest producer, is bottomed at 3,620 feet and underreaming the 6¼-inch at 3,610 feet. It is probable this well is on top of the Sundance, and as it had some oil in the Morrison, the prospects are considered favorable for proving up an extension to the Iles Pool. At 3,574 feet it was reported having 1,800 feet of oil in the hole. The same company has two tests on the Moffat Dome, to the northeast of the Iles Dome, in which definite results in the Sundance are expected soon. One well had been drilled to the Sundance previously but water intrusion, probably from above, had not made it a satisfactory test of the sand though it was commercial. Its No. 5 Walter Wick, Section 10-4n-92, set the 6¼-inch on top of the Sundance at 4,619 feet. Total depth is 4,646 feet. Cement has been drilled out and hole bailed dry and drilling in is believed to be in progress. This well is on a slightly lower contour than its No. 11 Knowlton and should it come in as a producer it will indicate that the deeper sands are productive over a larger area than the Dakota from which the principal production in the past has come. Its No. 11 Knowlton, SE cor. Section 33-5n-91, cemented the 6¼-inch at 4,543 feet and is believed to be on top of the Sundance.

Vineland District

Drilling wells in the Vineland district 15 miles southeast of Pueblo show no important changes this week and while there are reports of oil shows in some of the wells, nothing has yet shown up to justify the extensive drilling campaign that was getting under way only to come to a sudden halt. The discovery well, the Vineland Oil Co.'s No. 1 Shaw, NW NW Section 3-22-63, is in such bad condition that no test is possible and it has been decided to abandon the hole. The Continental Oil Co. has made a deal with the Vineland people whereby it will drill another well alongside the first one and is rigging up a machine for No. 1-A Shaw, SE NW NW Section 3-22-63, only a few feet away from No. 1. This well is expected to tell definitely the story of the first well which caused the excitement. The Christy-Frantz Corp.'s No. 1 Vey, SW NW Section 13-22-63, is still shut down at 1,425 feet after finding water in the Dakota, and the same firm's No. 1 Mannerich, NW SW Section 34-21-63, also is idle at 1,050 feet. The Dickason-Hench Oil Co.'s No. 1 Stanbeck, SW NW Section 19-22-62, is shut down at 1,060 feet and is reported to have water in the Dakota. C. W. Sheffer's No. 1 State-Oliver-Lubers, NW SE Section 4-22-63, the nearest well to the discovery, is running casing. Total depth is reported to be 1,040 feet in the first Dakota with water going over the top. The Dakota was topped at 1,030 feet, with a show of oil at 1,035 feet. The Amarillo Production Co.'s No. 1 Pahl, SW NW Section 35-22-63, is drilling at 750 feet, and the Nordic Oil Syndicate's No. 1 Carr, SW SW Section 13-22-63, is reported shut down at 650 feet. The Security Oil Trust's No. 1 Bush, NW NW Section 14-22-63, is preparing to run casing at 615 feet to shut off water. The four rigs up for the Windle Brothers, three on the NE NW Section 5-22-63, NE SW Section 6-22-63, and NW cor. Section 11-22-63. None of these had reached the spudding stage. The fourth rig was on the Sundance Oil Co.'s No. 1 Oliver-Lubers, SW SE Section 35-21-63. The latter was a contract job and had buried the bit.

Adams County

A test is to be drilled on the Watkins anticline, near the town of that name in Adams County, northeast of Denver in the Denver basin, by Nettie M. Slatt and others. Standard derrick is being erected for No. 1 Hills, SE SE Section 27-3s-64. It will start in a 24-inch hole with standard tools and is intended as a 5,000-foot test. The gathering of leases in that area has been in progress for several months.

In Fremont County, Raddatz, Vogel and Travis are making their No. 20, NE NE Section 33-20-69, in the south extension of the Florence Pool, into a deep test. This area, which is about 10 miles south of the old Florence Pool, has been producing from the shale at around 2,000 feet for several years. The deep test will go to the Sundance, which has never been drilled in that area, and is now bottomed at 4,200 feet and running the 5⅜-inch casing. This firm has a large acreage in that area and has been successful in developing shale production. The Dakota has been tested several times in the old field and environments, but carried water. The Continental Oil Co.'s No. 3 Vezetti, NE NE Section 11-19-70, in the west extension, is plugging back from 3,610 feet to 2,500 feet, and the same firm's No. 3 Dunn, NW SE Section 35-18-70, is rigging up.

In the town of Lyons in Boulder County, Section 18-3n-70, C. E. Johnson and others' No. 1 McFadden, which showed some freakish high grade oil at 65 feet, has a crooked hole at 317 feet and probably will be abandoned. Their No. 1 Campbell is still bottomed at 47 feet, where it struck a pocket containing either foul air or some noninflammable gas, an analysis of which is being made. Their No. 2 Campbell is drilling at 50 feet and is beginning to show a little of the freakish oil encountered in the first well. The plans of the operator are to drill out the shallow showing and see if it is commercial before undertaking a deeper test.

Wellington Dome

In Larimer County, the Continental Oil Co.'s No. 3 Mitchell, SE NE Section 6-9n-68, Wellington Dome, is bottomed at 4,370 feet and reported to have water in the hole on top of the Dakota. It is only one-fourth mile east of No. 1 Mitchell, the second big gasser drilled on the structure. The prospects are not encouraging.

In Montrose County, the Uncompahgre Oil & Gas Co.'s No. 1, Section 27-50-10, is drilling at around 2,000 feet and a little oil is reported showing on the water bailed from the hole. It is carrying considerable water from an upper horizon. It is below the Sundance and is drilling towards the Shinarump conglomerate.

The Platte Valley Petroleum Co.'s No. 1 Patterson, SW SW Section 24-6n-61, on the Grasewood structure in Weld County, is active after being idle for several months. It is bottomed at 4,175 feet with the 6¼-inch set on the bottom. It is waiting for the cement to harden. This wildcat has had several good shows of oil and gas and is headed for the Dakota.

The High Line Oil Syndicate's No. 1 Peerless, NE cor. Section 23-8s-104, Mesa County, is shut down at 2,355 feet for engine repairs and to move the water line. It is showing a little oil and some gas, but has not yet reached the Dakota. The sand was expected at 2,300 feet, but the interval between it and the Frontier appears to have thickened out.

WYOMING

The Carter Oil Co.'s No. 1 State, SW SW Section 16-48-82, on the Billy Creek structure in Johnson County, Wyoming, north of the Salt Creek Field, which gave strong indications of opening a new light oil field two months ago, shows no material change except that it is proving to be a freak well which may do any one of several things before it is completed. The well, which is on the flank of the structure and was believed to be sufficiently down to miss the big gas in the Frontier on top, began showing oil in the Frontier at 3,210 feet. It was drilled with rotary tools to 3,240 feet. At the top it showed for 3,000,000 feet of gas and some sprays of oil. When the bottom was reached the pressure cleaned the hole and the well flowed 70 bbls. However, the oil was dead, very heavy and only 20 degrees gravity. Storm conditions prevailed at the time and operations were suspended until tanks could be erected and preparations made for a test. After the storm had passed the well was swabbed and made 60 bbls. in 12 hours before being cleaned out. The tools would not go to the bottom and it was supposed the hole had caved. However, efforts to clean out continued and one time the well made as much as 500 bbls. in 24 hours. The gas disappeared as well as the water which showed in the earlier period. It was discovered that instead of caving, sand from the bottom was being forced up in the hole and it sometimes rises as much as 300 feet overnight. It has been impossible to get the tools on bottom, but the oil continues to come back without the water or gas. Evidently, the pressure is coming from below which leads to the hope that oil will be found in the lower sands if it proves possible to continue to the deeper horizons.

On the North Casper Creek Dome in Natrona County, M. C. Weisman's No. 3 SE cor. Section 36-37-82, is reported to have scratched what is believed to be a stray sand at 2,014 feet and to have encountered a good showing of oil, the fluid rising several feet in the hole. It is still some distance above the objective.

Weston County

In Weston County, in the northeastern part of the state, the Wyoming Drilling Syndicate is preparing to resume in its test on Section 15-44-64, on the Howard Dome. It was drilled to 4,350 feet with cable tools and shut down last fall when the 6¼-inch casing collapsed. It was bottomed in the break between the first and second Wall Creek sands. Plans provide for tearing down the present derrick and erecting a 120-foot rotary derrick and to continue with rotary tools to the Lakota sand.

In Fremont County, the Kinney-Coastal Oil Co.'s No. 1 Dykeman, SE SW Section 22-3n-1w, Pilot Butte, is bottomed at 2,140 feet and underreaming the 12½-inch.

In the Oregon Basin Field in Park County, the Cody Petroleum Co.'s No. 7 Klindt, NW NE NE Section 7-51-100, has commenced spudding. The Big Horn Petroleum Co.'s No. 1 Hoodoo, SE SE Section 36-51-101, is testing. It was in the Embar at 4,688-4,700 feet and showing some water. The Enalpac Oil & Gas Co.'s No. 2 Cactus, SE cor. Section 6-51-100, is cementing casing on top of the Embar at 4,688 feet.

IDAHO

The California Co.'s No. 1 Sorensen, NW SW Section 33-3n-41, Meadow Creek structure, Bonneville County, Idaho, is drilling at 2,360 feet in brown shale. The hole is bottomed in the Thaynes group of the lower Triassic.

Citizens of Weiser are thinking joyously about the prospects of finding oil in a well in which they had hoped to find only water. A well drilled 1,508 feet failed to find water, but mining men of the vicinity declared the well brought up indications of oil. Promptly a meeting was called and a committee appointed to investigate the situation. Robert N. Bell, former state mine inspector, encouraged the belief that an additional 1,000-foot depth might find something promising.

Christion Vrang, geologist of Los Angeles, has returned to Idaho Falls from the Horseshoe structure, 40 miles northeast of Idaho Falls, where he has been in conference with Roy Zuvor in connection with the test which the Standard Exploration Co. (Wellington Peck group) is making of that structure. The well is on the SW Section 33-5n-44. Additional equipment has been ordered and will arrive in a few days at the switch on the Samuels' Coal Mine branch of the Oregon Short Line Railroad, which runs across the structure. Wellington Peck, executive of the company, will arrive in Idaho Falls in a few days to gain personal knowledge of the conditions at the test. Mr. Vrang, in discussing the development, says it is expected the hole will be put down 2,000 feet in the next two months, unless commercial discovery is made at shallower depth.

ROCKY MOUNTAIN PRODUCTION
Daily Average Runs Week Ended April 20

WYOMING	
Salt Creek	35,370
Big Muddy	2,300
Grass Creek	2,300
Elk Basin	870
Ferris	20
Rock Creek	2,550
Lance Creek	250
La Barge	1,740
Poison Spider	640
Oregon Basin	2,330
Osage	630
Lander	450
Byron	30
Lost Soldier	3,290
Simpson Ridge	60
Dutton Creek	50
Rex Lake	130
Hamilton Dome	620
Total Wyoming	53,630
MONTANA	
Cat Creek	1,430
Kevin-Sunburst	5,300
Pondera	2,760
Lake Basin	80
Total Montana	9,710
COLORADO	
Florence	1,063
Moffat	982
Fort Collins	2,558
Iles Dome	1,021
Rangely	100
Tow Creek	631
Boulder	25
Total Colorado	6,380
NEW MEXICO	
Rattlesnake	1,326
Hogback	270
Artesia	898
Cap Rock	410
Table Mesa	471
Total New Mexico	3,375
Total Rocky Mountain	72,955

WILDCAT OPERATIONS IN TEXAS PANHANDLE

(Continued from Page 53)

Marine Oil Co.'s No. 1 Sawyer, C SW, Sec. 5, Blk. G, G.C.&S.F. Sur. ..... T.D. 850 ft; S.R. 10-in. 800 ft.

GRAY COUNTY

Anderson et als' No. 1 Heitholt, C NE SW, Sec. 152, Blk. 3, I.&G.N. Sur. ..... S.D. 1,240 ft.

B. S. Arnold's No. 1 J. E. Mingale, C E 160 ac., Sec. 212, Blk. B-2, H.&G.N. Sur. ..... U.R. 8-in. csg. 2,310 ft.

Barnsdall Oil Corp.'s No. 1 M. B. Davis, NW cor. W½ SE, Sec. 9, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 2,850 ft; S.O. 2,820 ft; show gas 2,836 ft.

Camel Oil Co.'s No. 1 Harrah-B, 330 ft. each way from NW cor. NE, Sec. 150, Blk. 3, I.&G.N. Sur. ..... Drlg. 1,280 ft.

Champlin Ref. Co.'s No. 1 McLaughlin, 330 ft. S and W of NE. cor. Sec. 33, Blk. B-2, H.&G.N. Sur. ..... Drlg. 1,100 ft.

Crabtree Drlg. Co.'s No. 1 B. F. Talley, SW NE, Sec. 114, Blk. M-2, B.S.&F. Sur. ..... S.D. 2,740 ft.

Cockrell-McElroy et als' No. 1 McConnell, 330 ft. each way from NE cor. W½ SW, Sec. 174, Blk. 3, I.&G. N.R.R. Sur. ..... Drlg. 3,000 ft; show gas 2,890 and 2,920 ft.

Cockrell McElroy Oil Co.'s No. 2 McConnell, 330 ft. S and E of NW cor. W½ SW, Sec. 174, Blk. 3, I.&G. N.R.R. Sur. ..... Location.

Constantine et als' No. 1 Dial, 330 ft. S and E of NW cor. W½ NW, Sec. 32, Blk. 25, H.&G.N. Sur. ..... S.D. 2,965 ft; encountered salt wtr.

Danciger O & R. Co.'s No. 1 H. K. Beck, 330 ft. S and E of NW cor. NW, Sec. 28, Blk. B-2, H.&G.N. ..... Rigging up.

Danciger et als' No. 1 Sheridan, SE cor. Sec. 184, Blk. B-2, H.&G.N.R.R. Sur. ..... Temp. abd.

Delaney and Associates Oil Co.'s No. 8 Jackson, 990 ft. S and 330 ft. E NW cor. E½ SW, Sec. 88, Blk. B-2, H.&G.N.R.R. Sur. ..... Cellar.

Dye & Gillette's No. 1 J. L. Noel, 330 ft. each way from SE cor. E½ NE, Sec. 187, Blk. 3, I.&G.N.R.R. Sur. ..... Drlg. 1,800 ft.

Eslick & McKinney's No. 1 Mrs. Hopkins, 330 ft. from NE E½ NE, Sec. 84, Blk. B-2, H.&G.N. Sur. ..... C.O. 3,161 ft; shot 80 qts. 3,130-57 ft.

Sines & Steiger's, formerly Eslick et als,' No. 1 Mrs. J. A. Hopkins, NW cor. W 80 ac. of SW, Sec. 84, Blk. B-2, H.&T.C. Sur. ..... Fish. pipe 3,206 ft.

Gardner Bros. and Collins' No. 1 Lincoln-Saunder, 330 ft. S and W of NE cor. W½ NE, Sec. 3, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 820 ft.

Gardner Bros. & Collins' No. 2 Saunders, 350 ft. from N on center line of W 68 of W½ of E½ of J. G. Eustis Sur. ..... Location.

Gulf Prod. Co.'s No. 1 Jackson, 295 ft. N and 305 ft. E of SW cor. W½, Sec. 62, Blk. B-2, H.&G.N.R. R. Sur. ..... Location.

Harrell's No. 1 McConnell, 330 ft. S and W of NE cor E½ SE Sec. 187, Blk. 3, I.&G.N.R.R. Sur. ..... Driving 20-in. csg. 252 ft.

Independent O. & G. Co.'s No. 1 Hottenbeck, 990 ft. each way from NE cor. NE, Sec. 176, Blk. 3, I.&G. N.R.R. Sur. ..... Drlg. 2,160 ft.

Magnolia Pet. Co.'s No. 4 J. B. Bower, 330 ft. S and 270 ft. E of NW cor. Sec. 63, Blk. B-2, H.&G.N.R. R. Sur ..... Spudding.

Magnolia Pet. Co.'s No. 1 Gething, 530 ft. each way from SE SW, Sec. 14, Blk. A-9, H.&G.N. Sur. ..... T.D. 3,075 ft. to P.B

Marland Prod. Co.'s No. 2 Brown, 330 ft. N and W of SE cor. Sec. 32, Blk. B-2, H.&G.N.R.R. Sur. ..... Drlg. 450 ft.

McLain Oil Co.'s No. 1 Back, 1,000 ft. from W line and 330 ft. from N line, NW, Sec. 24, Blk. 25, H.&G. N. Sur. ..... S.D. 2,215 ft; 1,000,000 ft. gas 2,-105-10 ft. and estimated 3,000,-900 ft. gas 2,202-08 ft.

McMan O. & G. Co.'s No. 1 Saunder, 330 ft. N and E of SW cor. E 80 acres W½ of E½, J. G. Eustice Sur. ..... Drlg. 1,400 ft.

Midwest O. & G. Co.'s No. 1 Bower-B, 1,650 ft. from E and 330 ft. from N lines, Sec. 93, Blk. B-2, H.&G. N.R.R Sur. ..... T.D. 3,297 ft; P.B. 2,190 ft. and shot 60 qts. 3,069-3,163 ft; C.O.

Nabob Oil Co.'s No. 2 Morse, 660 ft. from W line and 330 ft. from S line SW, Sec. 67, Blk. 25, H.&G.N. R.R. Sur. ..... Cellar.

Operator Oil Co.'s No. 1 Faulkner, 330 ft. N and E of SW cor. of W 60 acres Sec. 30, Blk. B-2, H.&G.N.R.R. Sur. ..... Drlg. 2,350 ft.

Operators Oil Co.'s No. 7 Jackson, 330 ft. S and 270 ft. W of NE cor. N½ NE, Sec. 88, Blk. B-2, H.&G.N. ..... Drlg. 1,285 ft.

Phillips Pet. Corp.'s No. 5 Jackson, 330 ft. S and 990 ft. E of NW cor. S½ NE, Sec. 88, Blk. B-2, H.&G.N. ..... Spudding.

Phillips Pet. Co.'s No. 1 Palmer, 330 ft. N and W of SE cor. Sec. 31, Blk. B-2, H.&G.N.R.R. Sur. ..... Drlg. 2,450 ft.

Panhandle Ref. Co.'s No. 1 Saunder, 330 ft. S and E of NW cor. E½ NE, Sec. 3, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 1,520 ft.

Panhandle Ref. Co.'s No. 2 Saunders, 330 ft. S and W of NE cor. E½ NE, Sec. 3, Blk. 1, A.C.H.&B. Sur. ..... Spudding.

Scott Drlg. Co.'s and others No. 1 Chapman, 330 ft. N and E of SW cor. of S½ of NE Sec. 69, Blk. 25, H.&G.N. Sur. ..... Location.

Shamrock Pet. Co.'s No. 2 Chapman-A, 990 ft. E and 330 ft. from S lines S½ SW, Sec. 70, Blk. 25, H.& G.N.R.R. Sur. ..... Drlg. and carrying 8-in. 2,140 ft.

Shamrock Co.'s No. 2 Clayton, 330 ft. S and 425 ft. E of NW, W. S. Clayton 277.4-ac. tract out of Sec. 50, Blk. 25, H.&G.N. Sur. ..... Location.

St. Clair Oil Co.'s No. 1 Dial, 330 ft. S and W of NE cor. SE, Sec. 10, Blk. 25, H.&G.N.R.R. Sur. ..... Cellar.

St. Clair Oil Co.'s No. 1 Rowe, Sec. 32, Blk. R ..... S.D. 3,490 ft. with H.F.W.

St. Clair Oil Co.'s No. 1 L. S. Stockton, SE cor. Sec. 35, W. R. Lee Sur. ..... Spudded and S.D.

Southern Pet Exp. Co.'s No. 4 McConnell, 330 ft. N and E of SW cor. NW, Sec. 174, Blk. 3, I.&G.N.R.R. Sur. Drlg. 2,765 ft.

Sun Oil Co.'s No. 1 Purviance, 330 ft. S and W of NE W 80 acres, Sec. 61, Blk. B-2, H.&G.N.R.R. Sur. Drlg. 1,685 ft.

The Texas Co.'s No. 5 J. B. Bowers, 330 ft. N and 990 ft. E of SW cor. of E½, Sec. 89, Blk. B-2, H.&G. N.R.P. Sur. ..... Drlg. 2,365 ft.

The Texas Co.'s No. 6 Bowers, 270 ft. W and 330 ft. N of SE cor. E½, Sec. 89, Blk. B-2, H.&G.N.R.R. Sur. ..... Rigging up.

The Texas Co.'s No. 7 Bowers, 330 ft. E and 990 ft. N of SW cor. E½, Sec. 89, Blk. B-2, H.&G.N. Sur. Rigging up.

The Texas Co.'s No. 6 Chapman-A, 330 ft. N and 756 ft. E of SW cor. SE, Sec. 51, Blk. 25, H.&G.N. Sur. Drlg. 600 ft.

The Texas Co.'s No. 1 Faulkner, 330 ft. each way from NW cor Sec. 29, Blk. B-2, H.&G.N. Sur. ..... Drlg. 1,940 ft.

The Texas Co.'s No. 2 Faulkner, 330 ft. each way from SW cor. Sec. 29, Blk. B-2, H.&G.N.R.R. Sur. ..... Drlg. 1,630 ft.

The Texas Company's No. 5 McLarty-A, 330 ft. S and E of NW cor. Sec. 2, Blk. 1, A.C.H.&B. Sur. ..... Drlg. 270 ft.

The Texas Co.'s No. 2 McLarty-B, at center of J. M. Rose Sur. ..... Rig.

The Texas Co.'s No. 10 Saunders, 330 ft. N and W of SE cor. W½ of J. G. Eustis Sur. ..... Crooked hole 2,552 ft.

The Texas Co.'s No. 1 Purviance et al, 330 ft. each way from NW cor. Sec. 61, Blk. B-2, H.&G.N.R.R. Sur. ..... Derrick.

Travis et als' No. 2 Back, 330 ft. each way from NW cor. E½ SE cor. Sec. 44, Blk. 25, H.&G.N.R.R. Sur. S.D. 1,420 ft.

Travis et als' No. 1 J. S. Morse, SE NW SW, Sec. 68, Blk. 25, H.&G.N. Sur. ..... 30,000,000 ft. gas 2,592-2,610 ft; light spray oil 2,740-45 ft; increase at 2,790-92 ft; flowing 120 bbls; C.O. 7,805 ft.

Wilcox-Pampa Oil Co.'s No. 6 Comb-Worley, 330 ft. N and 990 ft. E of SW cor. Sec. 60, Blk. 3, I.&G.N. R.R Sur. ..... Drlg.

Wilcox-Pampa Oil Co.'s No. 31 Worley Reynolds, 330 ft. N and E SW cor. SE SW, Sec. 61, Blk. 3, I.&G.N.... S.O. 2,928 ft; T.D. 3,154 ft; may shoot.

HOCKLEY COUNTY

World Oil Co.'s No. 1 Ellwood, 320 ft. from N and W lines, League 7, Wilbarger County school lands; elevation 3,363 ft.; contract depth 5,000 ft. ..... S.D. 1,455 ft.

HARTLEY COUNTY

Amarillo Oil Co.'s No. 9 Lee Bivins "A," C NW, Sec. 6, Blk. 21 ..... T.D. 3,610 ft; fish. csg.

Canadian River Gas Co.'s No. 10 Burns-A, 660 ft. N and 660 ft. E, Sec. 18, Blk. 2, G.&M. Sur. ..... Drlg. 2,020 ft.

HUTCHINSON COUNTY

Antelope Creek Oil Co.'s No. 3 Sanford, 330 ft. from N line and 330 ft. from W line of E½ S 160 ac. of Sec. 82, Blk. 46, H.&T.C. Sur. ..... T.D. 3,090 ft; shot 80 qts 3,045-90 ft; lime, no results; C.O.

Amarillo Oil Co.'s No. 2 Ingerton-A, 1,650 ft. from N line, 1,071 ft. from E line, Sec. 41, H.&T.C.R.R. Sur. Drlg. 260 ft.

Gulf Prod. Co.'s No. 44 Dial, 330 ft. N and 325 ft. W of NE cor. Sec. 36, Blk. M-23, T.C.R.R. Sur. ..... Location.

Gulf Prod. Co.'s No. 45 Dial, 660 ft. S and 660 ft. W of NE cor. S½ Sec. 25, Blk. 47, H&T.C. ..... Location.

Holmes et als' No. 1 Moore, 330 ft. N and E of SW cor. N½ E 80 ac., SE, Sec. 125, Blk. 4, I.&G.N.R. R. Sur. ..... Rigging up.

Marland Prod. Co.'s No. 1 Johnson-C, 450 ft. S and W of NE cor. Sec. 5, Blk. 1, B.&B. Sur. ..... Set 8-in csg. 2,820 ft.

Marland Prod. Co.'s No. 1 Sanford-C, 783 ft. N and 230 ft. W of SE cor. N½, Sec. 79, Blk. 46, H.&T. C.R.R. Sur. ..... Spudding.

Oil Operators Trust Co. and Marland's No. 2 J. M. Stanford-B, Sec. 82, Blk. 46, H.&T.C. Sur. ..... S.D. 3,039 ft.

Phillips Pet. Co.'s No. 4 Johnson-Pulaski, 330 ft. from N line and E line of W½, Mary Whitley Sur. ..... Run. 10-in. csg. 835 ft.

Phillips Pet. Co.'s No. 5 Johnson Bros. (Florence), 330 ft. each way from S and E line of E½, Mary Whitley Sur. ..... Set 10-in. csg. 815 ft.

Phillips Pet. Co.'s No. 6 (Florence), 330 ft. each way from S and W lines, E½ ..... Rig.

Phillips Pet. Co.'s No. 3 Sanford-Garland, 330 ft. N and E of SW cor. Sec. 77, Blk. 46, H.&T.C. Sur. ..... T.D. 2,964 ft; P.B. 2,907 ft; T.P. 2,952 ft; lime; swb. 100 bbls. first 24 hrs.

The Texas Corp.'s No. 2 Moore, 990 ft. from N line and 330 ft. from W line SW, Sec. 125, Blk. 4, I.&G.N. Sur. Drlg. 2,490 ft.

Timms et als' No. 1 Moore, 330 ft. N and E of SW cor. S 40 ac. NW, Sec. 21, Blk. M-21, T.C.R.R. Sur. ..... Drlg. 2,790 ft.

KING COUNTY

The Texas Co.'s No. 1 J. H. Johnson ..... S.D. 4,300 ft.

Huff Oil Co.'s No. 1 Martin, 1,320 ft. from N line and 1,320 ft. from E line, Sec. 171, Blk. F, H.&T.C. Sur. Rig.

LAMB COUNTY

Dan Freel et als' No. 1 Ellwood, CWL, Sec. 9, Blk. T, T. A. Thompson Sur. ..... S.D. for wtr. 447 ft.

LIPSCOMB COUNTY

Brown et als' No. 1 Box T Ranch, SW NE, Sec. 612, H.&T.C. Sur. ..... S.D. 3,128 ft.

Ruby Oil Co.'s No. 1 C. W. Jones, NE SW, Sec. 100, H.&T.C. Sur. ..... S.D. 4,428 ft.

LUBBOCK COUNTY

Center Oil Co.'s No. 1 Bowles Ranch ..... Small show oil 1,133-40 ft; sand; fish. 4,167 ft.

MOORE COUNTY

Amarillo Oil Co.'s No. 2 Warrick, C S 160 ac., Sec. 92, Blk. 46, H.&T.C. Sur. ..... Drlg. 2,120 ft; 10-in. cmtd. 2,000 ft.

Barnsdall Oil Co.'s No. 1 Harrison, 330 ft. from N line and 330 ft. from E line of S½ NE, Sec. 5, Blk. M-2 Drlg. 250 ft.

Canadian Gas Co.'s No. 1 Kilgore-A, 2,716 ft. S and 2,695 ft. W of NE cor. Sec. 1, Eustis Sur. ..... U.R. 8-in. csg. 2,910 ft.

Devonian Oil Co.'s No. 1 Sneed, 330 ft. N and 2,335 ft. W of SE cor. of S 160 ac. of N 320 ac., M. Robinson Sur. ..... Drlg. 3,416 ft; show gas 2,780-85 ft.

Dixie Creek Oil Co.'s No. 4-A Sneed, Jr., 330 ft. S and W of NE cor. E½, Sec. 65, Blk. 3 ..... T.D. 3,354 ft; preparing to complete for gas well.

Fritch O. & G. Co.'s No. 1 Lee Burns, C NE 40 ac. of N 160 ac., Sec. 4, Geo. Mahan Sur. ..... Spudded and S.D.

Skelly Oil Co.'s No. 6 Armstrong & Byrd, 1,600 ft. S and 990 ft. E NW cor. of J. N. Proctor Sur. ..... T.D. 3,173 ft; swbd. 329 bbls. oil and 175 bbls. wtr. first 24 hrs; T.P. 3,165-72 ft; wtr. at 3,173 ft.

Skelly Oil Co.'s No. 7 Armstrong & Byrd, 2,260 ft. S and 990 ft. E NW cor. J. N. Proctor Sur. ..... Drlg. 2,650 ft; 8¼-in. 2,230 ft.

Phillips Pet. Co.'s No 1 Burnett, 330 ft. each way from NE cor. NE, Sec. 192, Blk. 3-T, T.&N.O. Sur.. T.D. 3,436 ft; pulling line to C.O.

Phillips Pet. Co.'s No. 3-A Sneed, Jr., 1,600 ft. S and 430 ft. W of NW cor. J. N. Proctor Sur. ..... Drlg. 2,870 ft; first show gas 2,-515 ft; 10,000,000 ft. gas 2,515-2,800 ft.

Phillips Pet. Co.'s No. 1 Taylor, 330 ft. N and E of SW cor. E½ NW cor. Sec. 244, Blk. 3-T, T.&N. O. Sur. ..... T.D. 2,650 ft; S.D. for completion of No. 1 Burnett.

MOTLEY COUNTY

Explth. Co.'s No. 1 Tillson ..... Drlg. 3,925 ft.

Explth. Co.'s No. 5 Matador, C, Sec. 45, Blk. J-B, C.B. &C.N.G.R.R. Sur. ..... Spudding.

Explth. Co.'s No. 6 Matador, 330 ft. from N line and 330 ft. from E line, Sec. 132, Blk. M ..... Rig.

Matador Oil Corp.'s No. 1 Owen, C NE, Sec. 10, Blk. G, B.&B. Sur. ..... Rig.

ROBERTS COUNTY

Big Bend Oil Co.'s No. 1 Ledrick, Sec. 7, Blk. 5-A..... Preparing to pull liner and U.R. 4-in. at 5,975 ft.

WHEELER COUNTY

Arnold Oil Co. et als' No. 1 Ritchey, 420 ft. from E and 160 ft. from S lines of NW cor. Sec. 5, Blk. 24, H.&G.N. Sur. ..... S.D. 2,270 ft.

Byrens et als' No. 1 Johnson, SW cor. NE, Sec. 88, Blk. A-5, H.&G.N. Sur. ..... S.D. 2,920 ft.

Gibson Oil Co.'s No. 7 Bentley, 330 ft. N and W of SE cor. NW SE, Sec. 42, Blk. 24, H.&G.N. Sur. ..... Rig.

Holmes et als' No. 1 Close, 660 ft. N and W of SE cor. Sec. 82, Blk. 23, H.&G.N. Sur. ..... Drlg. 1,185 ft.

Lone Star Gas Co.'s No. 1 Turnbow, C NE SW, Sec. 67, Blk. 17, H.&G.N.R.R. Sur. ..... Drlg. 1,800 ft.

Lone Star Gas Co.'s No. 1 Griswold, C of NE of SE Sec. 1, Blk. 24, H.&G.N. Sur. ..... Spud.

Lone Star Gas Co.'s No. 1 Ridenger, C SW NW, Sec. 65, Blk. 17, H.&G.N.R.R. Sur. ..... Rig.

Mudge Oil Co.'s No. 2 Hicks, C SE of NW Sec. 52, Blk. 17, H.&G.N. ..... Drlg. 575 ft.

L. W. Rook's No. 2 A. Smock, C SW SE, Sec. 5, Blk. 24, H.&G.N. Sur. ..... Rig.

Upham Gas Co.'s No. 1 Raybo, C S½ NW NW, Sec. 105, Blk. 23, H.&G.N. Sur. ..... Show gas 1,695 ft; pulling pipe.

MEN KNOWN IN OILDOM

George H. Jaques

When George H. Jaques, general superintendent of the Midwest Refining Company, was a boy working in machine shops he used to leave his job as soon as he believed he had learned all he was likely to in it and move on to another shop. The practice carried him into many western states, into Canada and Mexico. He worked for railroads in Nebraska, Washington and in Canada. He served as master mechanic of large mines in Butte and Anaconda, Mont. In 1914 he quit his position as assistant master mechanic for El Oro Company near Mexico City and after a brief service with the Goldfield Consolidated Company in Goldfield, Nev., he took his first job in the oil business, working first for the Monte Bello Oil Company at Fillmore, Calif., and then for the Union Oil Company of California.

In 1917 Mr. Jaques left California to go with the Midwest Refining Company in Casper, Wyo. He first constructed shops in the Big Muddy Field and after that the Casper shops. Then he rebuilt the shops at Midwest in the Salt Creek Field. His duties threw him into close contact with the company's development and production operations. Thus it came about that he was promoted from machine shop superintendent to assistant general superintendent. Then when A. H. Peake resigned as general superintendent to take charge of the Dixie Oil Company's properties in Louisiana Mr. Jaques succeeded him.

Mr. Jaques was born in La Salle, Ill. While he was a boy the family moved to Fairbury, Neb. Before reaching his majority young Jaques started further west, working in machine shops. He married in 1916. He has two sons, 10 and 7, and a daughter of 4. Mr. Jaques has patented several oil field inventions and he has been active in the standardization program of the American Petroleum Institute

PERSONAL PARAGRAPHS

E. A. Brown has moved from Toledo, Ohio, to Covington, Ky.

* * *

Paul Edkin, formerly of Beaver, Pa., is now located in Tulsa.

* * *

E. L. Farris, meter tester of the Union Gas Corporation, has been transferred from Independence to Chanute, Kans.

* * *

J. V. Thomas, vice president of the Natural Gas Equipment Company, Los Angeles, has been in Tulsa reorganizing the Tulsa branch office.

Arnold S. Bunte has removed from Rankin, Tex., to Duncan, Okla.

* * *

A. L. Hawkins has left Carlsbad, N. Mex., for San Antonio, Tex.

* * *

Frederick G. Clapp has returned to Paris from a visit to the oil fields of Egypt.

* * *

H. G. Seidel and Orvill Harden have been elected directors of the Standard Oil Co. of New Jersey.

* * *

Robert L. Colley has been chosen treasurer of Atlantic Refining Company, succeeding the late A. H. Hill.

* * *

E. V. Kessinger, of the Empire Companies' engineering department, has returned from a trip to New York, Boston and Chicago.

* * *

Edward Prizer, chairman of the board of directors of the Vacuum Oil Company, and his daughter, have been on a visit to Cairo, Egypt.

* * *

Charles Laskey, prominent in North Louisiana gas producing, transporting and marketing circles, has returned to Shreveport from New York.

* * *

Forrest M. Towl, New York City, president of the Southern Group of Pipe Lines, and Mrs. Towl, stopped over in Pittsburgh, Pa., en route to Cleveland, Ohio.

* * *

J. A. O'Shaughnessy, of St. Paul, Minn., an oil producer and refiner in the Mid-Continent fields, paid a visit to the Muskegon, Michigan, Field recently.

* * *

Stacy Dorn has been placed in charge of the land department and D. D. Christnes as geologist in the reopened offices of the Marland Production Company at Fort Worth, Tex.

* * *

A son, Thomas Gent Foster, was born on April 15 to Mr. and Mrs. M. E. Foster. Mr. Foster is assistant sales manager of the Phillips Petroleum Company, Bartlesville, Okla.

* * *

J. C. Trees and his newly wed wife have returned to Pittsburgh, Pa., from a honeymoon trip to South America. They are domiciled at Mr. Trees' country home near Gibsonia, Pa.

* * *

J. W. F. Bennett, vice president of Stevens & Wood, and E. P. Matthiessen were elected directors to succeed Frederick Rogers, deceased, and Phillip De Ronde of Andes Petroleum Corporation.

* * *

Tex Crawford, scout for the Humble Oil & Refining Company in the Shreveport, La., division for several years, has been transferred to the West Texas district with headquarters at Wink.

* * *

Phillip Showell, formerly with the Utah Oil & Refining Company at Salt Lake City, Utah, is superintendent in charge of the Marland Refining Company's new grease plant at Ponca City, Okla.

* * *

C. W. Cahoon, who recently resigned as president of the Carson Petroleum Company, is now in California. Mr. Cahoon expects to establish a home in California for the remainder of the year at least.

* * *

Frank O. Prior, vice president of the Dixie Oil Company, Shreveport, La., paid a hurried visit to the Muskegon, Michigeon, Field, where his company operates the only complete gathering line system in the field.

* * *

T. J. O'Sullivan, assistant secretary of the North Louisiana and Arkansas division of the Mid-Continent Oil and Gas Association, Shreveport, La., spent several days in Houston, Beaumont and Lake Charles working up a nucleus for a Gulf Coast branch of operators who have holdings in Louisiana and Arkansas.

* * *

P. M. Miskell, general manager of the refining and marketing departments of the Empire Oil & Refining Company, sailed from England on the Leviathan, April 20. He will return to Tulsa about May 2. Mr. Miskell for the past 60 days has been investigating market conditions in Europe for the City Service Export Company.

C. L. Netherland, general freight agent of the Illinois Central Railroad, Memphis, Tenn., was in Tulsa and other Mid-Continent points last week calling on the large shippers of petroleum products.

* * *

Carl G. Anderson, chief geologist of the Johnson Oil Refining Company, has arrived in Muskegon from Tulsa, to spend several weeks surveying the Muskegon Field where his company holds extensive leases.

* * *

Edwin W. Smith has been elected a director of Duquesne Light Company, Pittsburgh, Pa., succeeding the late Judge James H. Reed. Winfield D. Carson was also elected a director, succeeding A. W. Robertson, resigned.

* * *

R. W. Howe, vice president and general manager of the Atlantic Pipe Line Company, transporting agency of the Atlantic Oil Producing Company, accompanied by his family visited old friends in Shreveport, La., recently.

* * *

Dr. A. Wade Schwitalla, of the crude oil purchasing department of Shell Petroleum Corporation, of Tulsa, and his secretary, H. A. Alford, spent several days in Muskegon conferring with producers in regard to the purchase of crude oil.

* * *

W. F. Chisholm, supervisor of the minerals division of the Louisiana Conservation Department, was selected by the Southern Division of the American Mining Congress to represent the State at the fourth annual Industrial Development conference at Atlanta, Ga.

* * *

Robert Treganowan, managing director of Ramsay & Treganowan, Ltd., of Melbourne, Australia, will sail May 2 for the United States, making his first stop at Los Angeles. He is interested in purchasing crude for the manufacture of lubricating oils in Australia.

* * *

W. J. Coppinger and D. F. Henry of the land and production department of the La Salle Petroleum Corporation, Tulsa, are on an inspection trip to West Texas and New Mexico points. The La Salle corporation which recently took over the assets of the Noble Oil & Gas Company, has leases in West Texas and New Mexico.

* * *

T. J. Neilan, president of Neilan, Schumacher & Company, manufacturers of automatic control equipment and regulating devices, has just arrived in the Mid-Continent. Mr. Neilan is to visit present representatives in the Mid-Continent and expand distribution to additional territory.

* * *

Charles S. Jones and L. M. Lockhart, vice presidents of the Rio Grande Oil Company, recently accepted delivery of a plane in the East and flew the new ship to Los Angeles where it will be used for geological surveys in California and Texas and for the use of company executives.

* * *

James J. Johnson, vice president and acting head of the Johnson Oil Refining Company, of Chicago, made a trip to the Muskegon, Michigan, Field to confer with representatives of his company there with regard to plans for the erection of a 5,000-barrel refining plant in Muskegon.

* * *

J. H. Jenkins, vice president of the Tidal Oil Company, a Tide Water Oil Company subsidiary, who has been in charge of the Texas office, has been transferred to California, where he will be general superintendent in charge of production, land and geological work for the Tide Water-Associated Oil Company.

* * *

A number of Bradford, Pa., oil men who have been spending all or a part of the winter in softer climes than northern Pennsylvania have returned home. Recent homecomers have been Mr. and Mrs. H. M. Wick from St. Petersburg, Fla.; Mr. and Mrs. Robert Roy from Mineral Wells, Tex.; Mr. and Mrs. Fred D. Gallup from St. Petersburg, Fla.; Mr. and Mrs. J. R. Walker from California points; Mr. and Mrs. Fred A. Miller from Hollywood, Fla.; Mr. and Mrs. Robert George from Mineral Wells, Tex.; Mr. and Mrs. Hugh Grant and Otto Koch from St. Petersburg, Fla.

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EMSCO STEEL EQUIPPED WELLS ARE SAFE

Underground Surveys of Oil Wells

Engineers, Geologists, Production Men and Others Interested in Data Which Are Important in Many Operations

By Alexander Anderson*
Fullerton, Calif.

The tables given in this paper may be of interest to those operators, petroleum engineers and geologists who are not familiar with oil well surveys.

In many oil fields a great variation in the production of adjoining wells has long been noticed, and a certain proportion of dry holes, situated between prolific producers, have been regarded as normal without thorough investigation as to cause.

Similarly, an occasional prolific producer has been found in a part of a field where all other holes have proven disappointing.

Adjoining wells which showed an unreasonable difference in their production have been surveyed, and the bottom of the poorer producer has been found to have lost sufficient vertical depth, through its drift, to seriously diminish

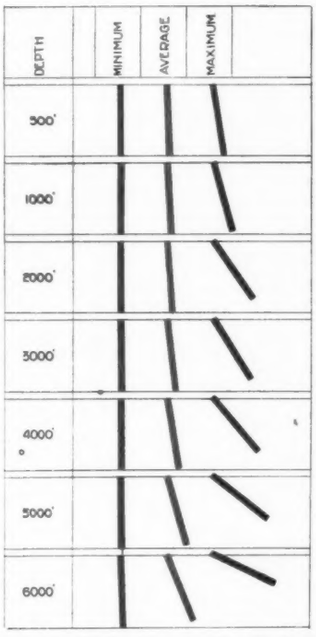


Figure 1.—Inclinations of oil wells from vertical. Graphic chart of the figures of Column "C" of Table 3.

its pentration in the oil zone. Again, the bottom of the good producer has been found to be more favorably situated by its migration up structure.

Surveying of wells in California fields has shown many instances where the dry hole has drifted far off the structure to such a degree that no amount of deepening could ever convert it into an oil well. In other cases, edge wells have been found to drift into the field.

At this time, in California, the surveying of oil wells is beginning to be accepted as a routine part of operating procedure. Some operators are surveying all of their new wells and, in some of the recently discovered fields, this practice is providing invaluable assistance in methodical development.

The information that has been obtained from the surveying of many wells has convinced most operators that it pays to give careful attention to the drilling of wells. Crews are now usually cautioned to avoid reckless competition with each other. Whereas, formerly certain companies demanded a large footage from their drillers, they now issue orders that a very moderate speed in drilling shall be maintained and every care be taken to avoid practices likely to cause excessive deviation of the hole from vertical.

As a result of these new instructions to drilling crews, a distinct decline in the average drift of the wells drilled by these operators has taken place and fewer dry holes are being drilled from good locations.

Aids Engineer and Geologist

To the petroleum engineer and the geologist, oil well surveys provide the necessary data required for the construction of the correct cross sections and enable true correlations to be worked out.

Where repressuring of sands is being considered, an exact knowledge of the position of the wells at bottom is extremely valuable.

To those responsible for running casing, the survey provides information showing at which points the casing is liable to stick and enables an intelligent reaming program to be carried out.

To those who are contemplating the financing of a partly drilled well, a survey will show whether the well is taking a favorable direction.

To the wildcatter, a survey will show whether the test well was reasonably vertical or whether it drifted off structure and did not constitute a test.

Where a considerable number of dips have been obtained from cores distributed throughout the depth of the well, and where the survey shows that the well has attained a high inclination, or has a moderate inclination and a considerable change in direction, it is sometimes possible to determine the amount and direction of dip of the strata.

The surveying of a discovery well may disclose valuable information as to the probability of other wells making similar production.

The above remarks and the following notes, which accompany the facts presented in the tables and figures of this paper, may be stated at the outset to be of very incomplete character.

Although the writer has been exclusively engaged in surveying oil wells for several years, he believes that many of the features and uses of oil well surveys could be better dealt with by some of the men whose business it is to utilize them in their work.

No complete reproduction of any surveys have been included in this paper but several of the writer's surveys have been published.

Survey Apparatus

The apparatus employed in making the surveys mentioned in this paper comprises a photographic recording mechanism enclosed in a water-tight casing and adapted to be run into the well on the end of a string of drill pipe or tubing. With the standard apparatus, 88 consecutive readings for inclination and direction of inclination may be taken during one lowering into the well. One reading is generally taken after each stand of pipe is lowered, or say, about 12 readings per 1,000 feet of hole. Usually, 12 readings per hour are taken in a well.

A. INCLINATION OF HOLE FROM VERTICAL	B. HORIZONTAL DRIFT PER 100 FT OF HOLE.	C. VERTICAL DEPTH DRILLED PER 100 FEET OF HOLE.	D. LOSS IN VERTICAL DEPTH PER 100 FT OF HOLE.
0°	0.0	100.0	0.0
5°	8.7	99.6	0.4
10°	17.4	98.5	1.5
15°	25.9	96.6	3.4
20°	34.2	94.0	6.0
25°	42.3	90.6	9.4
30°	50.0	86.6	13.4
35°	57.4	81.9	18.1
40°	64.3	76.6	23.4
45°	70.7	70.7	29.3
50°	76.6	64.3	35.7
55°	81.9	57.4	42.6
60°	86.6	50.0	50.0
65°	90.6	42.3	57.7
70°	94.0	34.2	65.8
75°	96.6	25.9	74.1

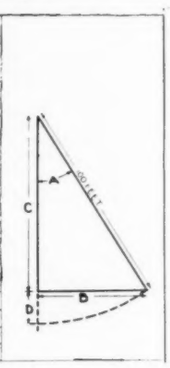


Table 1.—Horizontal drift and vertical depth per 100 feet of measured depth at different inclinations from vertical.

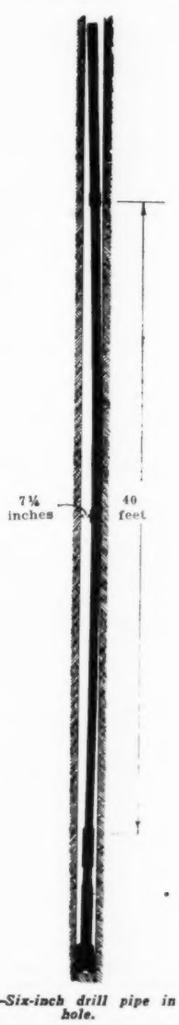


Figure 2.—Six-inch drill pipe in 15-inch hole.

Vertical angles are read to approximately the nearest 10 minutes and directions to about 3 degrees.

The writer has now surveyed nearly 2,000,000 feet of rotary hole. In the surveying of this footage the apparatus was run in about 800,000 feet of open hole. On no occasion has the apparatus ever been stuck, nor has any tendency to stick ever been observed. The apparatus is supplied with holes permitting circulation and occasionally the mud in a well has been reconditioned by circulating after the apparatus has reached bottom.

Operators often check the inclination of their wells with the acid bottle and by observing changes in the apparent dip shown by cores. It has not always been found to be safe to run a bailer into open hole for the purpose of taking an acid bottle reading.

Drift and Inclination of Rotary Holes

The maximum, minimum and average values of drift and inclination over a total of 1,158,542 feet of rotary hole are given in Table 3.

The inclinations and drifts shown as maximum in this table are limited by the fact that the survey apparatus was originally designed to record inclinations up to 54 degrees from the vertical and was later modified to measure inclinations to 65 degrees from vertical. As a consequence, the largest inclination from the vertical is shown as 65 degrees, 15 minutes.

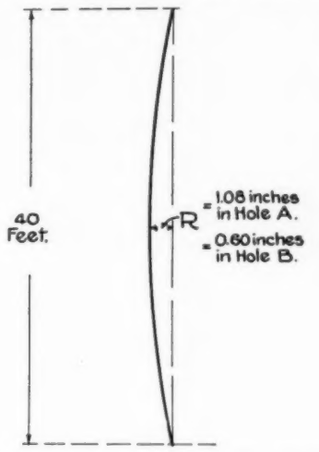


Figure 3.—This is diagram. The actual curvature is too small to draw to scale.

In about a dozen of the rotary holes included in the table, the survey ceased after the holes had reached an inclination between 54 degrees and 65 degrees from the vertical and the inclinations and directions of the lower portions of these particular wells are, therefore, not known.

Some of these holes were uniformly increasing in inclination with depth, and it seems certain that several of them became horizontal or pointed upward at bottom.

In one case where a bailer could not be run to the bottom of a rotary hole when surveyed, the hole was found to have an inclination of 60 degrees from vertical at the point where the bailer had stopped.

This well was increasing in its inclination and the operator judges from the cores obtained that it probably reached a horizontal position. The survey showed that the hole had drifted completely off the structure and the point where the

(Continued on Page 166)

*Presented before annual meeting A.I.M.E., New York.

Refining Crude Oil From Dundee Sand

Investigation Offers Practical Solution to Problem of Handling Michigan Crude Oil of Unusual Characteristics. Explain Complete Operation

By W. F. Faragher and J. C. Morrell
Universal Oil Products Co., Research Laboratories, Chicago, Ill.

Methods of refining Muskegon crude oil, involving the use of the cracking process that will permit the profitable handling of this crude are presented in this paper.

The crude oil produced from the Dundee sand near Muskegon, Mich., presents one of the most unusual refining problems encountered so far by the refining industry. Although the problem differs from that met in the refining of Lima crude oil, which was successfully handled by the copper-oxide process of Herman Frasch (1887-1894), the two examples are analogous in that the price of the oil was forced down to an unprofitable level because of difficulties of refining. With Lima crude oil, the problem was desulphurization; with Muskegon oil, the chief problem is the making of a motor fuel of good knock rating. Some difficulty is experienced also in making marketable products from Muskegon crude oil by ordinary methods of refining.

Similar situations have arisen from time to time in the history of oil production; e.g., the price of Smackover crude oil fell to an unprofitable level because of difficulty in the removal of water and the low content of gasoline. The production was sold principally as fuel oil. The situation was saved by cracking the Smackover crude oil into high yields of antiknock gasoline.

The seriousness of the problem is indicated by the announcement by E. J. Bullock, vice president of the Standard Oil Co. of Indiana, on February 7 of a cut in price of Dundee crude oil (the main producing district in Muskegon) from $1.26 per barrel to 50 cents per barrel. He said, it was reported, that only 10 per cent of the production would be bought by the company and purchases would be made for a limited time only. The reason given for this was the impossibility of refining into any merchantable product except fuel oil from the bulk of the production of the Muskegon Field.

The Oil and Gas Journal of February 14, 1929, page 138, quotes Mr. Bullock as follows:

"This Muskegon product makes unburnable kerosene and gasoline that we dare not place on the market because of its knocking and other bad qualities."

The National Petroleum News of February 6, 1929, page 66, states: "By itself the straightrun gasoline from the Dundee crude knocks badly in any car which is of moderately high compression or somewhat 'carboned up' "; and further that "possibly the most striking indication of its knocking tendencies is the fact that it requires about six cubic centimeters of tetraethyl lead to bring it up to the ordinary gasoline standards, and even 12 cubic centimeters will not bring it up to the Ethyl Gasoline standards." Refiners whose customers require a doctor sweet gasoline will experience difficulty in refining the product from this crude.

Apparently the production from the Traverse sand, the upper sand of the field, is acceptable, but this oil constitutes only a small proportion of the total production. When Mr. Bullock made his announcement, the total production of the field was 7,500 bbls. per day.

Reliable information obtained from one of the leading operators in the field fixes the present run of Dundee crude oil at 4,000 bbls. and of Traverse crude oil at 1,500 bbls. The same operator says that "Dundee runs could possibly be increased to 20,000 bbls. at present, with a possible flush production of 40,000 bbls." Hence it is obvious that many wells have been shut in, pending the solution of the refining problem.

According to the Greater Muskegon Chamber of Commerce, the estimated potential production of the Dundee Field is 30,000 bbls. per day. Wells in the Traverse sand are kept at the full production of about 1,000 bbls. per day.

The crude oil of this report was obtained from the Dundee sand near Muskegon, and is representative of the production of that sand. The analysis of the oil follows:

Analysis of Crude Oil From Dundee Sand
Including 100 cc. Engler Distillation

A.P.I. gr.°	38.8
I.B.P.-E.P. °F.	128°-712°
Flashpoint } Cleveland	Below Room Temp.
Firepoint } Open Cup	Below Room Temp.
Furol visc. @ 77°F.	10 sec.
Cold test	6°F.
Per cent B.S.&W. (benzol-centrifuge)	0.2

Per cent over	Temp. °F.
10	245
20	320
30	393
40	450
50	520
60	610
70	674
80	702
90	695
95	660
Endpoint	712

Per cent over	96.0
Per cent at 410 °F.	33.0
Per cent at 437 °F.	38.0
Per cent at 572 °F.	56.0
Per cent coke by weight	3.6

Paraffin wax by the modified Wyant and Marsh method was 0.46 per cent.

The crude oil was fractionated by Hempel distillation into gasoline, kerosene and fuel oil residue. The results of this distillation are as follows:

800 cc. Hempel Distillation of Crude Oil From Dundee Sand

A.P.I. Gr.°	38.8
I.B.P. °F.	87°

Per cent over	Temp. °F.
10	219
20	307
27.4	350
30	379
32.5	380
34.6	390
35.7	410
40	434
40.5	435
50	499
60	571
64.0	580

27.4% of 375°F. E.P.	A.P.I. 62.4
72.2% Bottoms	
0.4% Loss	
32.5% of 392°F. E.P.	A.P.I. 60.6
67.1% Bottoms	
0.4% Loss	
34.6% of 400°F. E.P.	A.P.I. 60.0
65.0% Bottoms	
0.4% Loss	
40.5% of 437°F. E. P.	A.P.I. 59.0
59.1% Bottoms (topped crude oil)	A.P.I. 26.1
0.4 % Loss	
23.5% of Kerosene Distillate	A.P.I. 41.3
35.6% Bottoms (reduced crudeoil)	A.P.I. 21.0
0.4% Loss	

Distillation Tests

These straightrun untreated gasolines and the kerosene distillate had the following distillation characteristics:

100 C.C. ENGLER DISTILLATIONS

Grades—	375°F. E.P.	392°F. E.P.	400°F. E.P.	437°F. E.P.	Kero. distillate
A.P.I. Gr.°	62.4	60.6	60.0	59.0	41.3
I.B.P.—E.P. °F.	121°-376°	129°-392°	131°-401°	115°-435°	448°-613°

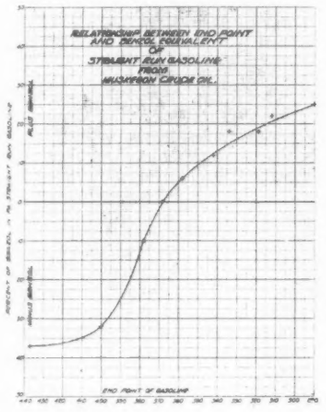
Per cent over	Temp. °F.	Temp. °F.	Temp. °F.	Temp. °F.	Temp. °F.
10	175	186	189	178	473
20	199	214	217	217	484
30	218	234	241	247	489
40	235	255	261	275	498
50	252	275	284	301	508
60	269	293	305	325	520
70	287	314	324	347	534
80	307	334	347	369	549
90	335	359	367	391	574
95	362	378	383	418	600
Endpoint	376	392	401	435	613
Per cent over	96.5	97.0	97.0	96.5	98.0
Per cent bottoms	1.5	2.0	2.0	2.0	2.0
Per cent loss	2.0	1.0	1.0	1.5	....

The kerosene refined as described later had the following properties:

Color, plus 25 Saybolt; flash point (Tag closed tester), 185 degrees Fahrenheit; flock test, negative; sulphur, 0.16 per cent; cloud point, 7 degrees Fahrenheit; distillation, endpoint 613 degrees Fahrenheit; burning test, burned freely and continuously for 16 hours without smoky or white deposit on chimney nor incrustation on wick. Flame was decreased only one-eighth inch in height and five-sixteenths inch in width. Very luminous flame.

The kerosene obtainable from this crude oil practically meets the requirements for United States Government kerosene, the specifications for which are given below:

Color, not darker than 16 Saybolt; flash point (Tag closed tester), not lower than 115 degrees Fahrenheit; sulphur, not over 0.125 per cent; flock, negative; distillation, endpoint shall not exceed 625


RELATIONSHIP BETWEEN END POINT AND BENZOL EQUIVALENT OF STRAIGHT RUN GASOLINE FROM MICHIGAN CRUDE OIL
END POINT OF GASOLINE

degrees Fahrenheit; cloud point, not over 5 degrees Fahrenheit; burning test, burn freely and steadily for 16 hours without incrustation on wick and fouling of chimney.

Possibilities of Corrosion

The crude oil contained 0.90 per cent of sulphur. The topped crude oil contained 1.49 per cent and the reduced crude oil 1.74 per cent. The topped and reduced oils will form enough hydrogen sulphide when cracked to necessitate making provisions against corrosion of the cracking still.

The corrosive action may be minimized by charging solutions of caustic soda, soda ash, or hydrated lime into the feed line or by coating the inside of the reaction chambers and dephlegmators with a protective lining.

The sample of crude oil contained 25 pounds of sodium chloride per 1,000 bbls. of crude oil, but no calcium chloride or magnesium chloride. There will be no evolution of hydrogen chloride during refining and cracking.

The 437 degrees Fahrenheit endpoint gasoline was removed from the crude oil in a semicommercial batch still using steam. A packed tower was used. The topped crude oil for cracking amounted to 59.1 per cent of the crude oil.

This topped crude oil had the following properties:

Analysis of Cracking Stock (59.1 Per Cent of the Crude)
Including 100 cc. Engler Distillation

A.P.I. Gr.°	26.1
I.B.P.-E.P. °F.	460°-724°
Flashpoint } Cleveland	230°F.
Firepoint } Open Cup	285°F.
Cold test	28°F.
Furol visc. @ 77°F.	24 sec.
Per cent B.S. (benzol-centrifuge)	0.5

Per cent over	Temp. °F.
10	515
20	545
30	582
40	632
50	678
60	700
70	705
80	702
90	696
Endpoint	724

Per cent over	95.0
Per cent at 572 °F.	27.5
Per cent coke by weight	5.0

The topped crude oil was cracked at a pressure of 200 pounds per square inch by the nonresiduum process, producing without recycling of pressure distillate bottoms, 76.9 per cent of pressure distillate and 23.1 per cent of coke and gas, including the loss.

The untreated pressure distillate was distilled through a Hempel column into the following fractions:

Analysis of Untreated Pressure Distillate
800 cc. Hempel Distillation

A.P.I. Gr.°	48.4
I.B.P. °F.	79°

Per cent over	Temp. °F.
10	162
20	211
30	251
40	285
50	325
60	365
61.1	370
64.3	380
78.1	440

61.1% of 392°F. E. P.	A.P.I. 61.0
38.5% Pressure-distillate bottoms	
0.4% Loss	
64.3% of 400°F. E. P.	A.P.I. 59.9
35.3% Pressure-distillate bottoms	
.04% Loss	
78.1% of 437°F. E. P.	A.P.I. 56.2
21.5% Pressure-distillate bottoms	A.P.I. 22.0
0.4% Loss	

The 370 degrees Fahrenheit cut of the above distillation made 392 degrees Fahrenheit endpoint gasoline, the 380 degrees Fahrenheit cut made 400 degrees Fahrenheit endpoint gasoline, and the 440 degrees Fahrenheit cut made 437 degrees Fahrenheit endpoint gasoline, all untreated.

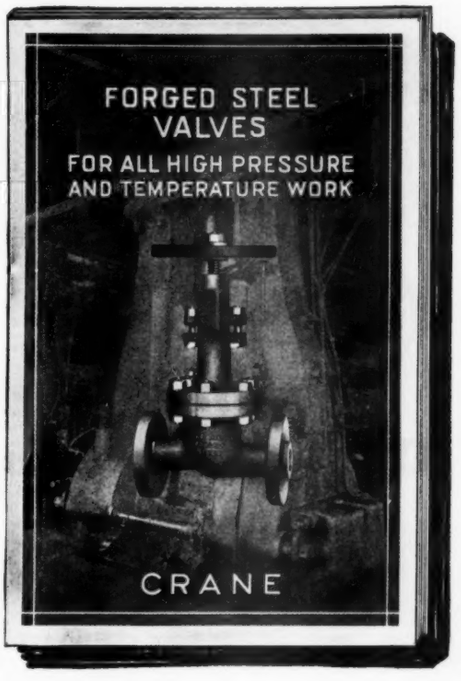
The distillation characteristics of these three untreated gasolines are as follows:

100 cc. Engler Distillation of Untreated Gasolines

Grades	392°F. E.P.	400°F. E.P.	437°F. E.P.
A.P.I. gr.°	61.0	59.9	56.2
I.B.P.-E.P. °F.	107°-391°	109°-400°	116°-438°
Per cent over	Temp. °F.	Temp. °F.	Temp. °F.
10	163	166	175
20	189	195	209
30	213	217	237
40	234	239	263
50	251	259	287
60	269	276	311
70	285	295	332
80	307	314	363
90	336	344	394
95	359	370	417
E.P.	391	400	438
Per cent over	97.5	97.5	97.5
Per cent bottoms	1.5	1.5	2.0
Per cent loss	1.0	1.0	0.5

The pressure-distillate bottoms made when producing the 437 degrees Fahren-

150 Pounds Pressure CRANE VALVES 2500 Pounds Pressure



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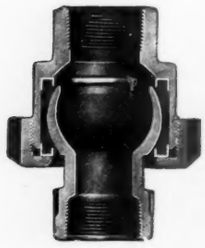

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heit endpoint gasoline had the following distillation characteristics:

100 cc. Engler Distillation of Pressure-Distillate Bottoms

A.P.I. Gr.°	22.0
I.B.P.-E.P. °F.	446°-760°

Per cent over	Temp. °F.
10	467
20	477
30	489
40	499
50	509
60	527
70	551
80	600
90	673
95	748
E.P.	760

Per cent over	98
Per cent bottoms	2

Summary Yield of Products

The following tabulation summarizes the yield of untreated products obtainable from the topped crude oil by cracking:

SUMMARY OF YIELDS
Untreated Products Based on Topped Crude Oil

Grades of gasoline	392°F. E.P.	400°F. E.P.	437°F. E.P.
% Gasoline	47.0	49.5	60.1
% Pressure-distillate bottoms	29.6	27.1	16.5
% Coke and gas, including the loss	23.1	23.1	23.1
% Redistillation loss	0.3	0.3	0.3
% Total	100.0	100.0	100.0

Recycling of the pressure-distillate bottoms should increase the yields of the respective grades to 54.8 per cent, 57.7 per cent and 70.0 per cent. The coke and gas including the loss would then become 44.9 per cent, 42.0 per cent and 29.7 per cent, respectively.

The gasoline of 400 degrees Fahrenheit endpoint made above was equivalent to 5 per cent of benzol in admixture with Pennsylvania straight-run gasoline. This is lower than the poorest grades of Mid-Continent straight-run gasoline and only slightly better than Pennsylvania straight-run gasoline.

The topped crude oil produced 60 pounds of coke and 625 cubic feet of gas per barrel of oil cracked. Recapitulating the yields on the basis of the crude oil and including the yield of straight-run gasoline obtained by the topping operation, the following figures are obtained:

SUMMARY OF YIELDS
Untreated Products Based on Crude Oil

Grades of gasoline	392°F. E.P.	400°F. E.P.	437°F. E.P.
% Gasoline by topping	32.5	34.6	40.5
% Gasoline by primary cracking	27.8	29.3	35.5
% Gasoline by recycling	4.6	4.9	5.9
% Total gasoline	64.9	68.8	81.9
% Coke and gas including the loss and recycling	26.5	24.8	17.5
% Redistillation loss including topping	0.6	0.6	0.6
% Straight-run naphtha not cracked	8.0	5.8	none
% Total	100.0	100.0	100.0

Cracking of Crude Oil

The straightrun 437 degree Fahrenheit heit endpoint gasoline and the kerosene distillate were removed in the semicommercial still, using steam and the packed tower for the gasoline but only steam and a short vapor line for the latter. The reduced crude, which amounted to 35.6 per cent of the crude oil, had the following characteristics:

Analysis of Cracking Stock (35.6% of Crude) Including 100 cc. Engler Distillation

A.P.I. gr.°	21.0
I.B.P.-E.P. °F.	568°-710°
Flashpoint { Cleveland	350° F.
Firepoint { Open Cup	410° F.
Cold test	38° F.
Furol visc. @ 77°F.	153 sec.
Furol visc. @ 122°F.	33 sec.
Per cent B.S. (benzol-centrifuge)	0.4

Per cent over	Temp. °F.
10	638
20	659
30	681
40	659
50	701
60	710
70	697
80	703
90	580
E.P.	710

Per cent over	92.0
Per cent @ 572°F.	Trace
Per cent water	Trace
Per cent coke by weight	7.5

Cracking Operation

The reduced crude oil was cracked at a pressure of 125 pounds per square inch by the non-residuum process, producing without any recycling of pressure-distillate bottoms, 67.5 per cent of pressure distillate and 32.5 per cent of coke and gas, including the loss.

The untreated pressure distillate was distilled through a Hempel column into the following products:

Analysis of Untreated Pressure Distillate
(800 cc. Hempel Distillation)

A.P.I. gr.°	50.7
I.B.P. °F.	82°

Per cent over	Temp. °F.
10	161
20	209
30	249
40	286
50	321
60	358
65.2	375
67.8	385
80.7	440

65.2 per cent of 392°F. E.P. A.P.I. 59.4
33.0 per cent pressure-distillate bottoms.
1.8 per cent loss.
67.8 per cent of 400°F. E. P. A.P.I. 58.7
30.4 per cent pressure-distillate bottoms.
1.8 per cent loss.
80.7 per cent of 437°F. E.P. A.P.I. 55.2
17.5 per cent pressure-distillate bottoms A.P.I. 25.9
1.8 per cent loss.

The 375 degree Fahrenheit cut made 392 degrees Fahrenheit endpoint gasoline, the 385 degree Fahrenheit cut made 400 degree Fahrenheit endpoint gasoline and the 440 degree Fahrenheit cut made 437 degree Fahrenheit endpoint gasoline, all untreated.

The distillation characteristics of these three grades of gasoline are as follows:

100 cc. Engler Distillation of Untreated Gasolines

Grades	392°F. E.P.	400°F. E.P.	437°F. E.P.
A.P.I. gr. °	59.4	58.7	55.2
I.B.P.-E.P. °F.	108°-392°	112°-400°	118°-438°

Per cent over	Temp. °F.	Temp. °F.	Temp. °F.
10	166	169	177
20	197	203	213
30	222	226	243
40	244	247	269
50	264	268	293
60	281	288	316
70	299	305	340
80	319	323	366
90	343	349	394
95	363	370	415
E.P.	392	400	438
Per cent over	97.5	97.5	97.5
Per cent bottoms	1.5	1.5	2.0
Per cent loss	1.0	1.0	0.5

The pressure-distillate bottoms made when producing 437 degree Fahrenheit endpoint gasoline had the following distillation characteristics:

100 cc. Engler Distillation of Pressure-Distillate Bottoms

A.P.I. gr. °	25.9
I. B. P.-E.P. °F.	447°-721°

Per cent over	Temp. °F.
10	473
20	481
30	490
40	499
50	511
60	527
70	550
80	586
90	639
95	680
E.P.	721

Per cent over	93
Per cent bottoms	2

Summary of Yields

The following tabulation summarizes the yields obtainable from the cracking of the reduced crude oil.

Summary of Yields—Untreated Products
(Based on Reduced Crude Oil)

Grades of gasoline	392°F. E.P.	400°F. E.P.	437°F. E.P.
% Gasoline	44.0	45.8	54.5
% Pressure-distillate bottoms	22.3	20.5	11.8
% Coke and gas including the loss	32.5	32.5	32.5
% Redistillation loss	1.2	1.2	1.2
% Total	100.0	100.0	100.0

Recycling of the pressure-distillate bottoms should increase the yields of respective grades of gasoline to 49.2 per cent, 51.2 per cent and 60.9 per cent. The coke and gas including the loss would become 49.6 per cent, 47.6 per cent, and 37.9 per cent, respectively.

The cracked 400 degree Fahrenheit endpoint gasoline made from the reduced crude oil had a benzol equivalency of

15 per cent of benzol in admixture with Pennsylvania straight-run gasoline. The antiknock quality is equivalent to Mid-Continent straight-run gasoline.

The reduced crude oil produced 77 pounds of coke and 620 cubic feet of gas per bbl. of oil cracked.

Recapitulating the yields on the basis of the crude oil and including the straight-run gasoline made by the reducing operation, the following values are obtained:

Summary of Yields—Untreated Products
(Based on Crude Oil)

Grades of gasoline	392°F. E.P.	400°F. E.P.	437°F. E.P.
% Gasoline by reducing	32.5	34.5	40.5
% Gasoline by primary cracking	15.7	16.3	19.4
% Gasoline by recycling	1.9	2.0	2.3
% Total gasoline	50.1	52.8	62.2
% Coke and gas including the loss and recycling	17.6	16.9	13.5
% Redistillation loss including reducing	0.8	0.8	0.8
% Heavy naphthas not cracked	8.0	5.8	none
% Kerosene distillate	23.5	23.5	23.5
% Total	100.0	100.0	100.0

Summary of Cracking Data—Untreated Products

Pressure, pounds	200	125
Kind of cracking Stock—	Topped Dundee Crude oil	Reduced Dundee Crude oil
% of crude oil	59.1	35.6
A.P.I. gr.	26.1	21.0
Pressure distillate—		
% Cracking stock	76.9	67.5
A.P.I. gr.	48.4	50.7
Residuum	none	none
Coke, lbs./bbl.	60	77
Gas, cu. ft./bbl.	625	620
Coke and gas including the loss—%	23.1	32.5
Gasoline (392°F. E.P.)—		
% Press. Dist.	61.1	65.2
% Cracking stock	47.0	44.0
% on crude oil	27.8	15.7
A.P.I. gr.	61.0	59.4
I.B.P.-E.P. °F	107-391	108-392
P.D. Cut °F.	370	375
Press.-Dist. Botts.—		
% Press. Dist.	38.5	33.0
% Cracking stock	29.6	22.3
% on crude oil	17.4	7.8
A.P.I. gr.	—	—
Gasoline (400°F. E.P.)—		
% Press. Dist.	64.3	67.8
% Cracking stock	49.5	45.8
% on crude oil	29.3	16.7
A.P.I. gr.	59.9	58.7
I.B.P.-E.P. °F.	109-400	112-400
P.D. Cut °F.	380	385
Press.-Dist. Botts.—		
% Press. Dist.	35.3	30.4
% Cracking stock	27.1	20.5
% on crude oil	16.0	7.3
A.P.I. gr.	—	—
Gasoline (437°F. E.P.)—		
% Press. Dist.	78.1	80.7
% Cracking stock	60.1	54.5
% on crude oil	35.5	19.4
A.P.I. gr.	56.2	55.2
I.B.P.-E.P. °F.	116-438	118-438
P.D. Cut °F.	440	440
Press.-Dist. Botts.—		
% Press. Dist.	21.5	17.5
% Cracking stock	16.5	11.8
% on crude oil	9.8	4.2
A.P.I. gr.	22.0	25.9
Loss—		
% Press. Dist.	0.4	1.8
% Cracking stock	0.3	1.2
% on crude oil	0.2	0.4

Treatment of Gasoline

The 437 degree Fahrenheit endpoint straightrun gasoline removed from the crude oil contained only 0.09 per cent of sulphur, but the material was very refractory to the usual refining methods for sweetening. Continuous washing with sodium plumbite solution with which free sulphur was used failed to give a sweetened product. Hypochlorite treatment did not sweeten the gasoline. Blowing with air in the presence of fresh plumbite solution and lead sulphide sludge for 12 hours failed to sweeten the product by converting the mercaptans into disulphides.

A satisfactory treatment was developed by blending the straightrun gasoline with the cracked pressure distillate in the proportion made from the topped crude oil and the cracking stock. The blend was treated and rerun as indicated below. The same method can be used for the cracked product by increasing the acid one or two pounds per barrel.

1. Wash with about 2 per cent by volume of 30 degree Baume sodium plumbite solution, settle, and draw the sludge.
2. Wash with water.
3. Agitate with 3 pounds of 66 degree Baume sulphuric acid per barrel of distillate, settle, and draw the sludge.
4. Wash with water.
5. Neutralize with about 1 per cent by volume of 16 degree Baume sodium plumbite solution, settle, and draw the sludge.
6. Distill with fire and steam at a still temperature which will allow maximum capacity of equipment and stability of color of the finished gasoline.

The freshly distilled gasoline was of plus 29 Saybolt color, noncorrosive to the copper strip, but positive to the doctor test. A treatment with 3 per cent by volume of sodium plumbite solution and just enough free sulphur to break down the lead mercaptide precipitate produced a noncorrosive and doctor-sweet gasoline. The color dropped to plus 21 Saybolt on exposure to sunlight due to the after treatment with plumbite and sulphur. The gum content of the finished sweet gasoline was 13.5 mgs. per 100 cc. as determined by the copper dish. The sulphur content was less than the 0.10 per cent specified for U. S. Motor gasoline.

Treating Pressure Distillate

The pressure distillate made from the topped crude oil contained 0.36 per cent of sulphur, while that made from the reduced crude oil contained 0.33 per cent of sulphur. Both distillates were refined by the following method:

1. Agitate with 6 pounds of 66 degree Baume sulphuric acid per barrel of distillate applied in two portions of 3 pounds each, settle, and draw the sludge.
2. Wash with water.
3. Neutralize with 1 per cent by volume of 16 degree Baume sodium plumbite solution, settle, and draw the sludge.
4. Distill with fire and steam at a still temperature that will allow maximum capacity of equipment and color stability of the gasoline.
5. Wash the gasoline with 1 per cent by volume of 2 per cent Baume caustic.

This treatment produced a gasoline of plus 30 Saybolt color which was light stable. The gasoline was also doctor-sweet and noncorrosive (copper strip). The gum content was less than 8 mgs. per 100 cc. by the copper dish and the sulphur content was 0.05 per cent.

Kerosene Treatment

The kerosene contained 0.35 per cent of sulphur. It was very refractory to all the usual sweetening processes and hence had to be rerun after treatment in order to obtain a product satisfactory in all respects. Although a simple acid plumbite treatment using 10 pounds of 66 degree Baume acid per barrel of kerosene followed by rerunning produced a kerosene with a plus 18 Saybolt color, the other properties which are required for marketability were not satisfactory. Treatment with fuming sulphuric acid was considered desirable. The kerosene was therefore treated as follows:

1. Wash with 2 per cent by volume of 30 degree Baume sodium plumbite solution, settle, and draw the sludge.
2. Wash with water.
3. Agitate with 5 pounds of fuming sulphuric acid (15 per cent free sulphur trioxide) per barrel of kerosene, settle, and draw the sludge.
4. Wash with water.
5. Neutralize with 3 per cent by volume of 16 degree Baume sodium plumbite solution, settle, and draw the sludge.
6. Wash with water.
7. Distill with fire and steam at a still temperature below 400 degrees Fahrenheit.

The above treatment produced a kerosene which was negative to the doctor test. It was sweetened by successive treatments with 16 degree Baume sodium plumbite and free sulphur. A large volume of plumbite was necessary to make a sweet product. The color of the kerosene was plus 25 Saybolt and the other properties were good as listed earlier in the paper. By continuous methods of treatment the total quantity of plumbite used can be reduced.

Motor Tests

From the preliminary motor tests made on the straightrun gasoline, it was apparent that the obstacle to the whole

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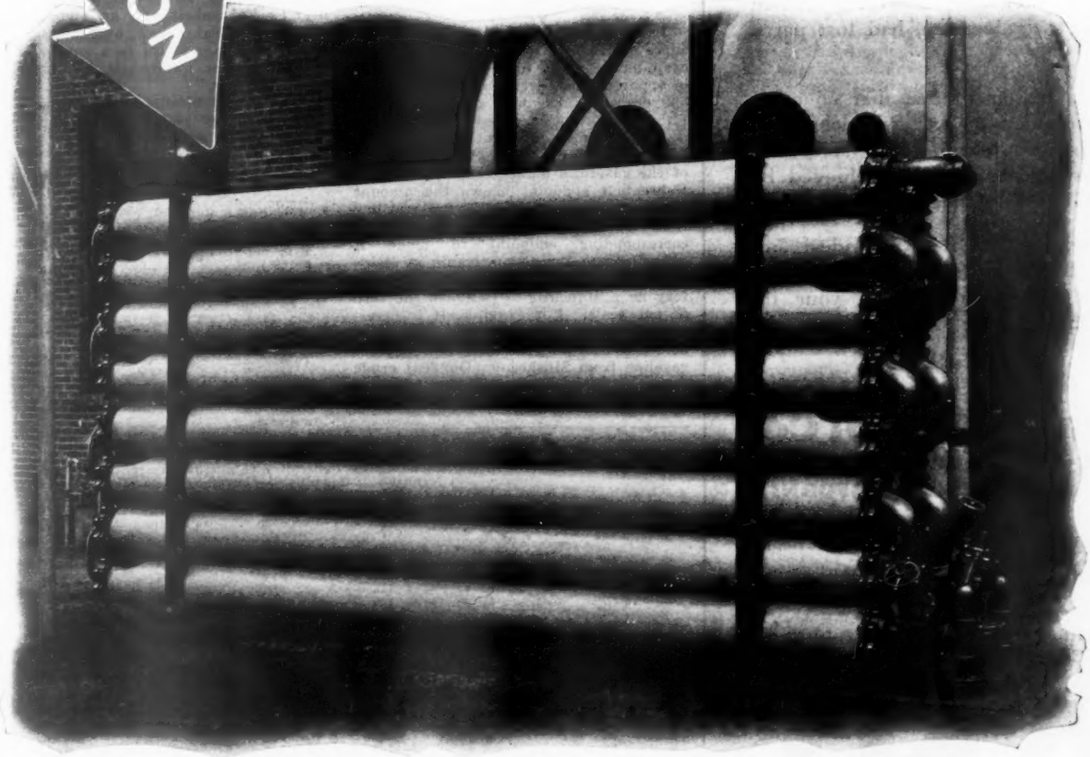

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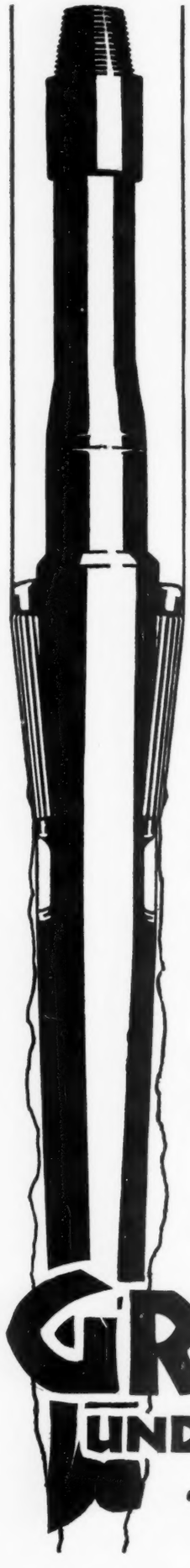

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"Used where performance counts"

problem of making marketable products from Muskegon crude was the knocking properties of the gasoline. A careful analysis was made of the knocking characteristics of various fractions of the crude which would ordinarily be included in the gasoline since it was believed that some of these fractions, especially the higher boiling ones, were contributing to an unusual extent to the knocking observed.

The motor tests were made upon a single cylinder Delco engine equipped with a watercooled head and bouncing pin with indicator, following the general method described by Faragher a. Hubner.[2]

The following table summarizes the results of this analysis, showing the per cent of the crude, the endpoint of the gasoline corresponding to this per cent, and the benzol equivalent measured. The benzol equivalent is defined as the per cent of benzol in a blend with a straightrun gasoline of definite characteristics, e. g., Pennsylvania straightrun gasoline that has the same knocking properties as the motor fuel under examination. The tabulation shows the relationship between the endpoint of various untreated straightrun naphthas from motor fuels produced from the Muskegon (Dundee) crude oil by Hempel distillation and the benzol equivalent:

Per cent of crude	Endpoint Gasoline	Per cent Benzol
7.0	290 °F.	+25.0
9.0	300	+22.5
11.5	310	+21.0
14.0	320	+19.0
16.0	330	+16.5
18.5	340	+13.5
20.5	350	+10.0
23.0	360	+ 5.0
25.5	370	— 1.5
27.5	380	—12.5
30.0	390	—25.0
32.5	400	—32.0
35.0	410	—34.5
37.0	420	—36.0
39.5	430	—36.5
40.5	437	—37.0

These data have been plotted as a curve which is also included. From an examination of the data and the curve, it is apparent that between an endpoint of 360 degrees Fahrenheit and 370 degrees Fahrenheit, the gasoline passes from a positive benzol equivalent to a negative benzol equivalent. The benzol equivalent of the gasolines higher than 370 degrees Fahrenheit endpoint shows the amount of benzol in blends with the gasoline from the Muskegon (Dundee) crude of corresponding endpoint to make it equivalent to the Pennsylvania straightrun gasoline, which is used in our laboratory as a standard to establish the zero of our scale. For example, it is necessary to add 37 per cent by volume of benzol to the straightrun Navy endpoint gasoline from Muskegon (Dundee) crude to bring it up to the knocking value of our straightrun Pennsylvania gasoline.

	Blending Naphtha	0% to 23% Cut from Straightrun Gasoline	23% to 43% Cut from Straightrun Gasoline	43% to 90.7% Cut from Straightrun Gasoline	Bottoms from Straightrun Gasoline
A.P.I. gr.°	58.0	72.2	60.8	53.2	44.4
I.B.P.-E.P. °F.	94°	194°-278°	198°-326°	294°-422°	416°-620°
Per cent over	Temp. °F.	Temp. °F.	Temp. °F.	Temp. °F.	Temp. °F.
5		125	211	311	426
10	177	132	215	316	431
15		139	218	321	433
20	23%-220	145	220	327	435
25		149	224	331	437
30		154	229	335	438
35		159	232	339	440
40	43%-280	164	235	343	441
45		169	237	347	443
50		174	240	350	446
55		179	243	354	449
60		185	246	359	452
65		189	250	363	455
70		195	254	367	458
75		201	257	371	463
80		209	262	377	469
85		217	270	383	478
90	90.7%-405	230	278	390	494
95		252	295	400	555
E.P.		278	326	422	620
Per cent over	90.7	97.0	98.0	98.0	98.5
Per cent bottoms	8.8	1.9	1.0	1.0	1.5
Per cent loss	0.5	2.0	1.0	1.0	
Per cent @ 437°F.					25.0
Per cent @ 572°F.					96.5

23 per cent I.B.P. to 220°F. A.P.I. 72.2
20 per cent 220° to 280°F. A.P.I. 60.8
47.7 per cent 280° to 405°F. A.P.I. 53.2

Examination of the data shows that a 350 degree Fahrenheit endpoint gasoline with a benzol equivalent of plus 10, representing 20.5 per cent of the crude, can be made from the Muskegon (Dundee) crude oil. The knocking qualities of this gasoline make it equal to the average Mid-Continent straightrun gasoline. This 350 degree Fahrenheit endpoint product can be sold direct as high test gasoline or may be blended with cracked gasoline from the cracking of the topped crude and reduced crude.

This proposal immediately opens up the question of the use of the fraction between 350 degree Fahrenheit endpoint and 437 degree Fahrenheit endpoint. There are several methods of procedure as follows:

Special Naphthas

By distilling off approximately 9 per cent of the crude, the remainder of the oil that would ordinarily go into motor gasoline in the crude oil can be worked up into the two following untreated products:

8.1 per cent of varnish maker's and painter's naphtha. 190 degrees Fahrenheit - 329 degrees Fahrenheit.

18.0 per cent of painter's solvent. 290 degrees Fahrenheit - 420 degrees Fahrenheit.

These products can be made to conform to all the specifications required by the purchasers of them.

The details of the analyses with regard to the manufacture of V.M.P. naphtha and painter's naphtha or painter's solvent are shown below:

(a) Low boiling motor fuel blending stock with an initial point of 104 degrees Fahrenheit and an endpoint of 278 degrees Fahrenheit.

(b) V.M.P. naphtha having an initial point of 190 degrees Fahrenheit and an endpoint of 325 degrees Fahrenheit, over 30 Saybolt color, and noncorrosive to a copper strip at 190 degrees Fahrenheit for a period of 30 minutes.

(c) Painter's naphtha or painter's solvent having an initial point of 290 degrees Fahrenheit and an endpoint of 420 degrees Fahrenheit, over 30 Saybolt color and noncorrosive to a copper strip at 290 degrees Fahrenheit for a period of 30 minutes.

(d) Heavy blending naphtha or still bottoms. The yield of the untreated products were as follows:

	Based on Straightrun Gasoline 437°F. E.P.	Based on Crude Oil
Low boiling motor fuel blending stock (104°-278°F.)	23.0%	9.3%
V.M.P. naphtha (190°-325°F.)	20.0	8.1
Painter's solvent (290°-420°F.)	47.7	19.3
Heavy blending naphtha (416°-620°F.)	8.8	3.6
Distillation loss	0.5	0.2
Total	100.0%	40.5%

The distillation characteristics of the various untreated products are as follows:

The low boiling blending stock (104 degrees to 278 degrees Fahrenheit) showed a benzol equivalency of 23 per cent. When blended with the cracked 437 degree Fahrenheit endpoint gasoline from the topped crude oil, which showed

[2] J.S.A.E. March, 1927.

an equivalency of 5 per cent in the ratio of 9.3 to 35.5, the benzol equivalency dropped to 13 per cent.

A blend of 9.3 parts of the low boiling blending stock with 8.1 parts of the V.M.P. naphtha had an engine value of 13 per cent of benzol. A blend of 9.3 parts of the low boiling blending stock, 8.1 parts of V.M.P. naphtha, and 35.5 parts of cracked gasoline from topped crude oil had an equivalency of 11 per cent.

The untreated low boiling blending stock, V.M.P. naphtha and painter's solvent were all above 25 Saybolt color and after a caustic wash to remove hydrogen sulphide, were noncorrosive to the copper strip at the initial boiling point of each product for a period of 30 minutes. All were strongly positive to the doctor test.

When the whole of the straightrun gasoline was treated with 3 pounds of 95 per cent acid per barrel, neutralized with plumbite solution, and rerun, the color of all products was above 30 and after caustic washing all samples were noncorrosive to the copper strip when exposed as described above.

The fractions were, however, very difficult to sweeten. After several washes with sodium plumbite, followed each time with the addition of enough free sulphur to break the soluble mercaptides into insoluble lead sulphide, products that were doctor sweet and noncorrosive were obtained.

There is a restricted market for such products as varnish maker's and painter's naphtha, painter's solvent, turpentine substitute and rubber solvent, which makes it necessary to have other outlets for the heavy naphtha remaining after the removal of a satisfactory antiknock gasoline from the Muskegon (Dundee) crude oil. Apparently, the largest market for this heavy naphtha fraction will be found in sale as domestic fuel oil or furnace oil. Accordingly the following tests were made to determine the possibilities in this proposal.

Furnace Oil

The following tabulation summarizes the tests made on furnace oil produced by atmospheric distillation of Muskegon crude oil and the cracking of the topped crude oil.

Material—	Flash point Pensky-Martens closed cup °F.	Max. pour point °F.	Max. B.S. &W. and color	Distillation Range per cent at 420 °F.	440 °F.	600 °F.	620 °F.
Heavy naphtha above 350°F. E.P. gasoline	96	Below 0	None +26 Saybolt	88	91	100 (507)EP	
18.5 parts heavy naphtha 23.5 parts Str.-R. kerosene	136	Below 0	None NPA 1	30	45	95	99 (619)EP
18.5 parts heavy naphtha 9.7 parts P. D. Botts. from Topped crude	116	Below 0	None NPA D	51	61	91	93 (710)EP
18.5 parts heavy naphtha 23.5 parts Str.-R. kerosene 9.7 parts P. D. Botts. from Topped crude	142	Below 0	None NPA 8	24	35	91	94 (679)EP

AMERICAN OIL BURNERS ASSOCIATION SPECIFICATIONS

Material—	Flash point Pensky-Martens closed cup. °F.	Max. pour point °F.	Max. B.S. &W. and color	Distillation Range per cent at 420 °F.	440 °F.	600 °F.	620 °F.
Light furnace oil No. 1	110°-165°	0	Trace No Color Specified	10	..	90	..
Medium furnace oil No. 2	125°-190°	0	Trace No Color Specified	..	10	..	90

In the above tests the 350 degrees Fahrenheit endpoint straightrun gasoline which has a benzol equivalent of +10 per cent has been considered as motor fuel. The remainder of the straight naphtha to 437 degrees Fahrenheit endpoint is utilized in the furnace oil blends together with the straightrun kerosene and the pressure-distillate bottoms made by cracking the topped crude oil. These domestic furnace oils are compared with two grades recently approved by the American Oil Burners Association and approved by the Fire Underwriter's Laboratory. These specifications are the result of co-operation between the American Oil Burners Association, the Bureau of Standards, the American Petroleum Institute, and the American Society for Testing Materials. The requirements can be met by any manufacturer and the material can be made from any crude. The gravity was eliminated to permit universal use.

A comparison of the results shows that the heavy naphtha cut, the straightrun kerosene, and the pressure-distillate bottoms can be utilized in one blend as domestic furnace oil No. 2. This blend has a good color corresponding to NPA 8, and is free from any sediment and water.

As a matter of information, a motor test was made direct upon the heavy naphtha which showed that it had a benzol equivalency of —50 per cent. A blend of this heavy naphtha with casinghead gasoline (81.4 degrees A.P.I. gravity) showed a benzol equivalency of —18 per cent.

Distillation Analyses

The distillation analyses of the heavy naphtha and the casinghead blend follow:

Distillation of Heavy Naphtha: 50 per cent casinghead gasoline; 50 per cent heavy naphtha.

A.P.I. Gr.°	50.8	64.7
I.B.P.-E.P. °F.	324°-507°	90°-442°
Flash °F. (Pensky-Martens)	96	
Per cent over	Temp. °F.	Temp. °F.
5	349	104
10	355	118
15	358	124
20	361	130
25	364	156
30	368	176
35	372	200
40	377	224
45	380	256
50	382	300
55	386	334
60	390	354
65	394	360
70	399	372
75	404	380
80	410	388
85	418	397
90	428	408
95	449	434
E.P.	507	442
Per cent over	98.5	97.0
Per cent bottoms	1.5	1.0
Per cent loss		2.0

Blending

Although the casinghead blend shows a satisfactory improvement over the straightrun Navy endpoint gasoline from Muskegon (Dundee) crude oil, it is not good enough to be marketed.

Recommended Ultimate Blend of Gasoline From Muskegon (Dundee) Crude Oil

The removal of light naphtha (I.B.P. 118 degrees Fahrenheit—endpoint 350 degrees Fahrenheit) from Muskegon crude oil leaves an intermediate heavy naphtha cut which can be utilized as painter's solvent or blended in the manner shown to produce domestic fuel oil.

The light naphtha was blended with a cracked gasoline made from the reduced crude or the topped crude in the proportion in which they were made from the crude. The following results were obtained by motor test:

	Benzol equivalent
Light naphtha (118°-350°F.) 53.2% of light naphtha 46.8% of 437°F. E.P. gasoline from reduced crude	+10% +13%
38.3% of light naphtha 61.7% of 437°F. E.P. gasoline from topped crude	+13%

The distillation analyses of these fuels are as follows:

Distillation of Blend: 53.2 per cent of light naphtha, 46.8 per cent of 437 degrees Fahrenheit endpoint gasoline from reduced crude.

Distillation of Blend: 38.3 per cent of light naphtha, 61.7 per cent of 437 degrees Fahrenheit endpoint gasoline from topped crude.

A.P.I. Gr.°	60.6	59.5
I.B.P.-E.P. °F.	110°-427°	108°-425°
Per cent over	Temp. °F.	Temp. °F.
5	150	148
10	168	168
15	184	182
20	198	196
25	208	206
30	218	216
35	228	225
40	238	237
45	247	248
50	257	260
55	268	272
60	279	284
65	292	295
70	304	308
75	320	324
80	336	340
85	356	360
90	382	382
95	414	414
E.P.	427	425
Per cent over	96.0	97.0
Per cent bottoms	1.0	1.0
Per cent loss	3.0	2.0

From the above results it is evident that blending the straightrun light naphtha with the cracked gasoline made from the topped crude or from the reduced crude, produced a motor fuel satisfactory from an antiknock and all other points of view.

It is also established by the work reported that the cracking process makes possible a complete utilization of the hitherto unprofitable Muskegon crude. All products produced are of good quality; the crude can be processed profitably by the proposed methods.

EASTERN FIELDS

(Continued from Page 76)

made locations for 18 wells. In Courthouse district, Lewis County, W. T. Turner has a rig up on the John Brown farm.

Roane County

In Geary district, Roane County, the United Fuel Gas Co. has started to drill on the W. W. Ogden farm. The same company is building a rig on the William H. Hunt farm. In Reedy district, D. W. Law & Co. have started to drill on the R. E. Tannant farm. In Sherman district, Calhoun County, the Hope Natural Gas Co. has started to drill on the F. S. Barr farm. In the same district, McIntosh & Co. are rigging up on the E. E. Miles farm. In Otter district, Braxton County, the United Gas Co. is drilling on the Israel G. Engle farm. In Lee district, Calhoun County, the Dunbar Oil & Gas Co. is building a rig on the G. W. Bennington farm. In Clay district, Wetzel County, the Hennen Oil & Gas Co. is rigging up on the E. M. Kimble farm.

On Twelve Pole Creek, Harvey district, Mingo County, F. B. Yates has a rig completed on the J. D. McManara farm. The location is 1,000 feet southwest of the test on the M. C. Burchett farm. On Louthers Run, Murphy district, Ritchie County, Rexroad and others have a rig completed on the George Rossin farm. On McFarlan Creek, the South Penn Oil Co. has a rig up on the Anna M. Wilson farm. On Indian Creek, same district, the Daniel O'Day estate and others have started to drill to the lower sand on the Vincent Morris farm, formerly a gasser in the Salt sand. At the head waters of Devil Hole Creek, Grant district, Ritchie County, 1 mile in advance of production, the South Penn Oil Co. has a rig completed on the Aaron Summers farm. On Elk River, Big Sandy district, Kanawha County, the Buff Lick Oil & Gas Co. has a rig completed on the Rebecca J. Young farm.

SOUTHWEST PENNSYLVANIA

In McCandless Township, Allegheny County, the Butchers Oil Co. has a 5-bbl. pumper on the Harvey Younkers lot. In the Duff City district, Harbison & Co. have a gasser in the Boulder formation on the Eckart farm. In Richhill Township, Greene County, the Natural Gas Co. of West Virginia has a Gordon sand gasser on the S. Johnson farm.

CANADIAN FIELDS

(Continued from Page 66)

alite's No. 25, LSD 8, Section 17-19-2w5, is rigging up.

Royalite's No. 8, LSD 15, Section 12-20-3w5, which has been frozen off at 3,753 feet, has come back into production, and is reported making 13,000,000 feet a day, with around 200 bbls. recovery.

Foothills Oil & Gas Co.'s No. 2, LSD 8, Section 1-20-3w5, is drilling at 4,174 feet. Foothills' No. 3, LSD 16, Section 8-19-2w5, is drilling at 1,836 feet. Foothills' No. 4, LSD 1, Section 26-20-3w5, is rigging up. Dalhousie's No. 7, LSD 11, Section 18-20-2w5, is rigging up.

Home Oil's Producer

Home Oil Co.'s No. 1, LSD 10, Section 20-19-2w5, is maintaining an average production somewhat better than 650 bbls. a day, and recently on test showed a peak production of 714 bbls. in 24 hours. This does not reach Royaltie's No. 4 maximum, which was around 740 bbls. for a single day, though the average of Home's No. 1 is a little better than the present average of the Royalite gusher. Home's No. 1 has experienced no trouble with freezing. Home's No. 2, LSD 14, same section, has cemented casing in the top of the lime at 5,353 feet, and is rigging up with the diamond outfit to drill into production. Home's No. 3, same LSD, cemented in the top of the lime at 5,033 feet, is fishing for a lost bit. Home's No. 4, same LSD, is drilling at 2,842 feet. North-West Associated's No. 1, LSD 6, Section 20-19-2w5, is at 4,687 feet on top of the Home sands, and running 8¼-inch casing.

Spooner Oils' No. 2, Section 24-20-3w5, is reported drilling below 5,130 feet, and more than 100 feet in the deep lime. Illinois-Alberta Oils' No. 2, LSD 14, Section 12-20-3w5, is at 3,620 feet and mudding off the gas flow which has interfered with drilling in the lime. Great West Oils' No. 1, SE Section 7-20-2w5, has dismantled its old derrick and is rigging up for a rotary outfit, which will resume drilling at 5,405 feet. Drilling will resume about May 1 and the test is expected to get the deep lime between 5,800 and 5,900 feet.

Calmont Oils' No. 1, LSD 2, Section 1-20-3w5, is cleaning out hole to 5,655 feet, with some increase in the gas production. Another shot has been put in to dislodge some metal still remaining in the hole from a string of lost tools.

McLeod Oil Co.'s No. 1, LSD 16, Section 1-20-3w5, is reported back in normal production with a crude naphtha recovery around 100 bbls. a day. The well came back, made 100 bbls. in 8 hours, and then froze off for several days, after which it again came into production. McLeod's No. 2, same LSD, is rigged up ready to clean out the hole as soon as drillers are available. McLeod's No. 4, same LSD, is reported making a steady production of around 75 bbls. a day from the lower horizon in the deep lime. McLeod's No. 3, same LSD, after being partly cleared by two shots, is fishing for lost cable tools.

New McDougall Segur Oil Co.'s No. 2, LSD 14, Section 12-20-3w5, is drilling 160 feet in the deep lime at 5,218 feet, with a somewhat increased wet gas production, estimated around 4,000,000 feet. It has not yet reached the main producing horizon in the lime.

Vulcan Oils' No. 1, LSD 11, Section 13-20-3w5, frozen off in the deep lime with a string of tools in the hole at 5,004 feet, has been cleaned out and

brought back to its normal production of 100 bbls.

In the Jumping Pound district west of Calgary, Imperial Oil's Bow River No. 2, LSD 11, Section 31-24-4w5, is standing cemented at 2,372 feet. In the Highwood district, Imperial's Highwood No. 1, LSD 3, Section 36-18-3w5, is at 4,152 feet, and sidetracking tools at 4,143 feet.

In the Waite Valley area, Cartier Oils, Ltd., of Calgary, is arranging for its No. 1 test. Cartier's No. 2 will be drilled in the Monarch district. Angus Oils' No. 1, LSD 5, Section 3-21-4w5, has derrick up on the same structure. Richfield Petroleum's No. 1, Section 35-20-3w5, has derrick up and will spud in about May 1. Herron Petroleum's No. 1, on the Herron structure, 30 miles west of Calgary, has been located in W half Township 22-5w5, close to the Elbow River, and rig timbers and machinery are being purchased. Aerolite Oil Corp. has secured acreage in LSDs 3 and 6, Section 20-18-3w5, on the Highwood structure, south of Warner Oil Co.'s test.

Moose Mountain

In the Moose Mountain district, Signal Hill Oil Co.'s No. 2, LSD 9, Section 34-23-5w5, is at 2,700 feet and waiting for casing. Maccabee Creek Oils, Ltd., has arranged to finance its No. 1 test in LSD 16, Section 33-23-5w5. Elbow Oils' No. 1, LSD 11, Section 35-22-5w5, has resumed drilling after cementing 20-inch casing at 80 feet.

Considerable activity is forecasted for the Morley Reserve area, an extension of the Moose Mopntain structure. Norcon Oil Co.'s No. 1 is reported spudding. Gold Coin Oils' No. 1 is being left at 3,928 feet and No. 2 is rigging up about a mile southwest of Ozada Siding, to spud in early in May. In the summer Gold Coin's No. 1 will be finished with a diamond drill outfit. Hugh Duffield will superintend the operations. Kamorley Oils, Ltd., a new organization, has located its No. 1 in the west end of the reserve, 2 miles west of Gold Coin's No. 2, and is reported working on derrick. A Montreal Syndicate has a location a mile east of the Kamorley test, to start drilling this summer. Wabash Oils' No. 1, shut down through the winter at 2,071 feet, is getting ready to resume. This test got the top of the Madison at the phenomenal high of 1,483 feet, but has so far failed to get commercial production, the lime being apparently of closer texture than in the Turner Valley. Melbourne Oils is resuming work on its test at Morley Station with a diamond drill outfit. Model Oils, Ltd. has a contract for a test on the Cobb & Warren lease.

In the Pincher Creek district, southern foothills Weymarn Oils' Mount Royal No. 1, LSD 4, Section 7-6-1w5, is rigging up to resume drilling at 1,000 feet. Work will be supervised by T. G. Slack, with Drillers George Stafford and J. W. Cooley on the well. The well will be drilled on its own gas, a flow of 500,000 feet having been struck in the earlier drilling; the main producing horizon is looked for between 1,500 and 1,700 feet.

In High River district, High River Oilfields' No. 1, LSD 6, Section 34-18-20w4, has derrick up and will spud in next month.

Skiff Field

In the Skiff Field, Imperial-Devenish's No. 3, LSD 11, Section 11-5-14w4, gave 84 bbls. a day production on a bailing test, with 200 feet of oil still in the hole. Production comes from the Ellis at 3,061 feet. The well did not make any water. The well may be drilled through the remaining 10 feet of sand, though a pumping production of 200 bbls. is expected at the present depth.

Imperial Oil, Ltd. has an arrangement with Devenish Petroleum, Ltd. whereby Imperial will put down four additional tests before the fall of 1930. Imperial-Devenish's No. 4 will likely be started as soon as No. 3 is finished. Location is expected to be close to No. 3.

O. G. Devenish will, independent of the Imperial-Devenish program, drill an independent test in the Skiff Field, where he holds 20,000 acres. Financing for this test has been arranged, and field work will start at once. Tentative location in Section 25-6-15w4. Lion's Gate Oil Co. of Vancouver has concluded its contract for acreage, and will start drilling before June 30. A drilling contract has been let in SE SE Section 33-6-15w4.

In Champion district, Hudson's Bay-Marland Oil Co. is hauling casing for its test in Section 9-16-23w4. Derrick is up and machinery is being installed. L. B. Morrow, for some years with Imperial Oil, Ltd. at Fort Norman, has joined the Hudson's Bay-Marland drilling staff.

On the Beaver Dome, Madison Oils, LSD 10, Section 24-2-11w4, is reported shut down at 731 feet with some gas pressure, but will resume as soon as road and drilling conditions improve.

East of Coutts, Ko-Tops Oils' No. 1, SE Section 2-1-17w4, is partly rigged up on the Red Coulee structure. Alberta Pacific Consolidated Oils of Calgary is planning to drill this season in the same area. Just south of the international boundary, Montalta Oils of Calgary is getting ready to drill on the Blarney Castle Dome, 12 miles north and west of the nearest Montana producer.

In the Wainwright Field, east central Alberta, Wainwell Oils' No. 1, LSD 9, Section 36-44-7w4, has been deepened to 2,215 feet, encountering a dry gas flow making 8,500,000 feet. The flow is under control and water and oil from higher levels is being cemented off, preparatory to drilling deeper, to test a possible oil horizon below the gas. Wainwell's No. 2, LSD 15, same section, has a flow of 12,500,000 feet shut in. Wainwell's No. 3, LSD 9, Section 36-33-7w4, which got oil at 2,072 feet, is standing idle pending results from No. 1. Wainwell's No. 4 has been contracted for, and will probably be put down with a larger hole to reach the oil sand indicated by coring in No. 2.

Hargal Oils, Ltd. of Vancouver has purchased another 400-acre lease in the Wainwright Field, giving it a total of 4,000 acres. The company is planning to drill three tests to the present Wainwright oil horizons, as well as a deep test. Fabyan Petroleums, Ltd. is arranging for a new test, in addition to completion of its No. 1 well in LSD 8, Section 24-45-8w4.

Ribstone Structure

Hol-Gar Petroleums, Ltd. has been organized by Seattle interests headed by Wilfrid Holmes and is planning to drill two tests on the Ribstone structure in eastern Alberta. No. 1 will possibly be started this month. Acreage is in Townships 45 and 46. Honeth Petroleums of Seattle is also planning to test the Ribstone structure.

The Smith-Bradford Oil & Gas Co. has been incorporated under Dominion charter with offices at Calgary to operate in the Montana and Alberta Fields. Provisional directors include Charles S. Smith, J. F. Bradford, Dr. E. W. DeLong, S. G. Jamieson, J. J. Kehoe, L. G. Schultz, H. J. Berke, Joseph Buxton and W. Rudd, all of Calgary. The company holds acreage with four producing wells in the Kevin-Sunburst Field and additional acreage in the south end of Turner Valley and the Aldersyde district in Alberta. Drilling will be carried on in both Kevin-Sunburst and Turner Valley.

On the Montana side, Western Natural Gas Co.'s wildcat in N SW NW Section 5-37-4e in the Sweet Grass hills, less than a mile south of the Canadian border, is reported drilling below 200 feet.

Arrangements are being made for resumption of work on the Medicine Hat Petroleum Co.'s test near Bull's Head, in the Medicine Hat district. Interests headed by J. E. King of Oklahoma are arranging to complete the test on a 50-50 basis, and it is understood C. E. Roth and associates are prepared to purchase any gas production developed for the projected gas line to Regina and Moose Jaw.

British Columbia

In British Columbia, Glacier Oil Co. is preparing to resume its test on Sage Creek, in the southeastern section of the province. The test is down 3,000 feet, with shows of light crude. B.C. Oil & Coal Development Co. has test down 1,100 feet with light crude showings, and is ready to resume. A Spokane group and a California syndicate are reported securing acreage and may drill this season. Operations in this area are limited to a few months in summer.

In Saskatchewan, Citizens Oil & Gas Co. of Saskatoon is preparing to resume work on Unity Valley's No. 2, SE Section 23-41-24w3, near Vera. This test was shut down last fall at about 2,900 feet. It was drilled on acreage subleased from Unity Valley Oil Co. The latter has a test standing at 2,925 feet with shows of oil and gas, and is planning to resume when No. 2 is finished.

Ontario Fields

In Dawn Township, Lambton County, Ontario, Union Natural Gas Co.'s No. 30 has finished dry in the Dawn sand at 2,200 feet, and No. 31, Al Wicks farm, has been abandoned around 2,300 feet without a show. Additional drilling will probably be started.

In Dover Township, Kent County, Union Natural Gas Co.'s No. 20 deep test is reported drilling between 350 and 400 feet in the Trenton limestone and looks like a failure. The location is north of No. 14, a small producer, and east of No. 13, one of the largest wells in the field. Ajax Oil & Gas Co. some time ago started No. 4 test some distance east of No. 3, which was a small producer in the Trenton.

In Howard Township, Kent County, Union Natural Gas Co.'s test on the J. B. Bennett farm is drilling around 1,400 feet, and should be finished by the end of the month. This is the first deep test drilled in the Ridgetown area, which has yielded considerable quantities of "surface" gas at comparatively shallow depths. The location is a little north of Lake Erie, and in line with important gas fields, both east and west, which parallel the north shore. Production is looked for in horizons corresponding to the Dawn and Tilbury sands, but as there is considerable drift in this area, the test is expected to go 1,600 feet before reaching this horizon, and may be carried considerably deeper.

Further east, in Elgin County south of St. Thomas, considerable leasing was done last year on a structure known as the Sparta Ridge by interests associated with the Central Pipe Line Co. of Chatham. This company is seeking a contract to deliver gas to the municipal plant at St. Thomas, and drilling will likely be undertaken. This structure is in line with both the Vienna and Richmond gas fields, to the east, and the Dutton and Mosa oil pools to the northwest.

In northern Ontario the Ontario Government is going ahead this spring with diamond drilling operations at Blacksmith Rapids on the Abitibi River. The actual exploratory work will be done, under contract, by Smith & Travers of Sudbury, with Dr. W. S. Dyer of the geological staff of the Ontario Department of Mines superintending operations. It is expected drilling will be commenced about May 15. The tests have a dual purpose, to determine the extent of the northern lignite deposits and also the possibilities of oil and gas in this area.

LOUISIANA-ARKANSAS

(Continued from Page 60)

1-B Muslow, Section 29-20-15, is in chalk at 1,860 feet.

Oil City—Magnolia Petroleum Co. is drilling shale at 2,789 feet on No. 18 Doan-Thigpen, Section 6-20-15. Shreveport Oil Corp.'s No. 1 Cheshire, Section 32-21-15, was dry on drill stem test at 2,156 feet and is coring. Simplex Oil Co. cemented 6-inch at 2,171 feet on No. 4 Baird, Section 22-20-15, and is bailing to test, total depth 2,220 feet.

LaSalle Parish

Urania—G. W. Zoder has rig up for No. 2 M. H. King, Section 13-10-1e.

Monroe District

Morehouse Parish—Southern Carbon Co. has rig up for No. 2 Griffing, Section 10-20-4; No. 9 Tensas, Section 2-20-4, is drilling at 2,135 feet.

Ouachita Parish—Greenwood Production Co. cemented 6-inch at 2,133 feet on No. 2 Phillips fee, Section 18-19-4. Imperial Oil & Gas Products Co. No. 7 Tubbs, Section 44-19-3, is drilling at 2,110 feet. Interstate Natural Gas Co. No. 2 Hunter & McCormick, 670 feet south and west NE cor. NW Section 13-19-3, set 12-inch at 187 feet and is drilling at 760 feet; No. 3 Hunter & McCormick, 660 feet north 40 degrees west and 660 west 44 degrees north, most easterly corner irregular Section 41-19-3, set 187 feet of 12-inch; No. 4 Hunter & McCormick, 1,676 feet south and 363 feet east NW cor. Section 1-19-3, cemented 12-inch at 193 feet. LaDel Oil Properties' No. 97 fee, Section 6-19-5, is drilling at 1,280 feet. Magnolia Petroleum Co. is drilling No. 1 fee, Section 14-18-4, at 1,800 feet; No. 2 United States, Section 30-19-5, cemented 196 feet of 15½-inch and is drilling at 1,804 feet; No. 3 United States, Section 18-19-5, set 184 feet of 15½-inch and is drilling at 640 feet. Maury Drilling Co.'s No. 5 McEwen, Section 29-19-4, is drilling at 1,800 feet. Nemours Corp. set 405 feet of 12½-inch, 980 feet of 8-inch and is drilling at 2,000 feet. Pioneer Oil & Gas Co. No. 1 Fudickar, Section 18-18-5, set 168 feet of 12-inch casing. Pipes & Mack set 8-inch at 2,163 feet on No. 2 McGee, Section 10-18-4. Southern Carbon Co.'s No. 12 Fairbanks, Section 34-20-4, cemented 6-inch at 2,108 feet. United Carbon Co. is drilling at 2,153 feet on No. 2 Spade, Section 36-19-3.

Union Parish—Feazel and others' No. 1 Peek, Section 16-20-4, set 6-inch at 2,094 feet. Natural Gas & Producing Co.'s No. 1 Nolan, Section 11-20-3, set 12-inch at 169 feet and 8-inch at 871 feet.

Red River Parish

Gulf Refining Co.'s No. 38 Robinson, Section 25-13-11, set 10-inch at 192 feet. Magnolia Petroleum Co. has rig up for No. 6 Carter, 634 feet north and 680 feet east SW cor. NE SW Section 13-12-11.

Richland Parish

Carbon Gas Co. set 183 feet of 12-inch and 871 feet of 8-inch on No. 1 McCoy, Section 8-16-6. Magnolia Petroleum Co. set 8⅛-inch pipe at 2,300 feet on No. 1 Sartor Co., Section 5-15-6. Southern Carbon Co. has derrick up for No. 1 Tegola, 1,980 feet north and 660 feet west SE cor. Section 4-15-6. Richland Producing Co.'s No. 1 J. H. Hemler, 1,320 feet west and 660 feet north SE cor. Section 2-16-6, set 15½-inch at 176 feet and 10-inch at 938 feet.

Sabine Parish

Pleasant Hill—Arkansas Natural Gas Corp. set 10-inch at 190 feet on No. 13 Logan, 2,230 feet south and 330 feet west NE cor. Section 33-10-12.

Webster Parish

Cotton Valley—Louisiana Oil Refining Corp.'s No. 6 Gray, Section 28-21-10, is in hard lime at 3,725 feet and No. 3 Nelson, Section 28-21-10, is drilling brown shale at 3,305 feet. Magnolia Petroleum Co. is rigging up to deepen No. 2 Ida Cox, Section 23-21-10, and is reaming to bottom on No. 6 Marshall, Section 21-21-10, total depth 4,400 feet; No. 1 McCook & Hibbler, Section 22-21-10, is drilling lime and shell at 4,894 feet.

Sarepta & Shongaloo—Pat Hudson is sidetracking drill stem at 1,650 feet on No. 1 Slack, Section 1-22-11, total depth 2,592 feet. Magnolia Petroleum Co.'s No. 1 Adkins, Section 4-22-9, is drilling at 2,503 feet; No. 1 B. M. Cook, Section 2-22-11, is in sandy shale at 3,071 feet; No. 1 Denman, Section 1-22-11, is bailing to test, total depth 2,719 feet.

EAST TEXAS

Panola County

Eureka Natural Gas Co.'s No. 3 Gully, James Matthews Survey, cemented 6-inch at 2,297 feet and No. 4 is drilling at 1,900 feet. Magnolia Petroleum Co.'s No. 3 T. C. Adams, James Matthews Survey, is shut down for orders after salt water test at 2,328 feet; No. 4 Ella Baker, B. C. Jordan Survey, is waiting orders after testing 1,000,000 feet of gas at 2,819 feet; No. 3 Lula

Fletcher, same survey, is drilling at 2,393 feet.

Harrison County

Nick Barbare is rebuilding the derrick on No. 1-A Bahan-Furrh in James Short Survey, total depth 1,400 feet, and on No. 1 Fuller-Furrh, same survey, total depth 2,318 feet. Eureka Natural Gas Co. has rig up to deepen No. 1 Cox-Timmons in the R. W. Bedford Survey, an old completion at 1,907 feet, and also on No. 1 State Line O. & G. Co.—Furrh in the Joel Lipscomb Survey, total depth 990 feet.

ARKANSAS

Ouachita County

Mount Holly—Cumberland Oil Co.'s No. 1 Burton, Section 24-15-18, is drilling with 10-inch set at 80 feet. Atlantic Oil Producing Co. and E. M. Jones' No. 1 Allen, Section 25-15-18, tested salt water at 2,866 feet and is coring volcanic ash, total depth 2,937 feet. Magnolia Petroleum Co.'s No. 1 Wilson, Section 25-15-18, is drilling at 2,855 feet; McDonald Brothers' 2-B Wilson, Section 25-15-18, set 104 feet of 10-inch and is drilling at 1,882 feet. Root Refineries is arranging for a drill stem test of 3 feet of sand, total depth 2,844 feet on No. 1 Wilson, Section 25-15-18.

Johnson County

Arkansas Natural Gas Co. tested 15,000,000 feet of gas at 3,360 feet on No. 1 Pherson, Section 10-10-24, and is running 7-inch casing; No. 2 Bynum, Section 12-10-24, is fishing at 2.500 feet.

Union County

El Dorado—Gulf Refining Co. is reaming to bottom on No. 1 Cook, Section 1-18-15, total depth 3,103 feet.

Champagnolle—Magna Producing Co. is rigging up to drill No. 2-B El Dorado Realty Co., in the NW cor. NW SW Section 7-17-13. Magnolia Petroleum Co.'s No. 1 Kelly, Section 9-17-14, is in hard sand at 2,685 feet. Ohio Oil Co. has rig up for No. 1 Lynn, 330 feet south and west NE cor. SW SE Section 7-17-13 and cemented 6⅝-inch at 3,013 feet on No. 1 B. H. Raulston, Section 12-17-14, total depth 3,017 feet.

LA.-ARK. WILDCATS

(Continued from Page 60)

Co. have bolstered hopes of deep production in this general locality which have waned considerably since a series of tests throughout southeastern Arkansas of which they are the last failed to reveal anything promising. Ohio Oil Co.'s No. 1 Jerome Lumber Co., Section 13-15-4, Drew County, the farthest north of any of the series, is checking normal with previous wells in this part of the state, finding the Nacatoch at 3,152 feet and drilling now around 3,450 feet.

The Eagle Mills, Ouachita County, project in which Shaffer, Empire, Phillips and Amerada companies share equal interests in an 8,000 acre block centering on Section 14-12-16 appears to be about to get down to business with probable location for their 3,500 foot test being in Section 11-12-16. A new block is being assembled in the far southeastern corner of Union County by unidentified interests who plan a 3,000 foot test on 1,000 acres centering on Section 4-19-13. Lion Oil Refining Co.'s No. 1 Stowe, Section 4-17-13, Union County, about half way between Champagnolle production and the hoped for production in Calhoun County, is drilling around 1,500 feet, about half way down.

In the northwestern part of the state Arkansas Natural Gas Co. tested 15,000,000 feet of gas and is cementing 7-inch casing on No. 1 McPherson in Section 10-10-24, Johnson County, total depth 3,360 feet. About a month ago this Clarksville district well was making an estimated 7,000,000 feet of gas between the 8 and 10 inch strings, total depth 3,330 feet. The third well to get under way in the Fayetteville district is Lincoln Lease Holding Co.'s No. 1 Lincoln, Section 30-15-32, Washington County, in Lincoln Townsite. The company has approximately 30,000 acres of leases, according to information here, and drilling with cable tools is down between 350 and 400 feet with 80 feet of 10-inch casing set on top of the lime. Company officials advise they plan to set 8-inch to 1,200 feet and then 6-inch. They also report plans for two more wells on the Fayetteville structure but by whom and probable location was not stated. Nor has any further information been obtainable recently on Gold Creek Oil & Gas Co.'s No. 1 Stermer, Section 17-4-13, Faulkner County, last reported shut down at 3,782 feet and by now probably abandoned; H. H. Givens' No. 1 Garrett, Section 1-3-19, Garland County, reported to have had a small show of gas at 2,956 feet and to have shot formation; Independent Oil & Gas Co.'s No. 1 Banks, Section 6-16-27, Madison County, (20 miles northeast of Fayetteville) which should be drilling around 1,000 feet, and W. F. Harris' No. 1 Halbert, Section 32-4-4, St. Francis County, in the northeastern part of the state.

D.C.R. Oil Co. was reported Saturday preparing to drill in and test, but the report was not confirmed. This well has been shut down with 6⅝-inch cemented at 2,388 feet, total depth 2,422 feet, with 21 fourbles of 39 gravity oil in the hole. Richardson has made offers to the larger companies but no trade has been reported and the talk has been that he will not drill plug until he disposed of a half interest in or all the property. Meanwhile three offsets have been begun and Gulf Refining Co. paid $7,500 cash and $30,000 out of the first seven-sixteenths oil and a one-sixth royalty for approximately 300 acres of school land in Section 16-19-14, Richardson's well being in Section 17. A fourth well is to be started by Simplex Oil Co. on the Dickson land in the SW NE Section 33-20-14 in consideration of a lease assigned it by Carmody and others who have 3,300 acres of leases around the Richardson block. Simplex also is to drill another well in Section 22-20-14. Gulf, Standard, Dixie, Texas and others have protection around the well.

T. B. Slick, who had 17,000 acres of 5-year commercial leases in the east half of Township 22-5 and the southwest of Township 23-5, Claiborne Parish, Louisiana, has added 14,000 acres more to his block and is understood to have a series of deep tests under way during the current year. The additional acreage is in the west half of Township 22-4. Southern Crude Oil Purchasing Co. has approximately 4,500 acres centering around Section 21-23-6, Claiborne Parish, on which it is obligated to start a 4,500 foot test not later than July 6, location of which probably will be in Section 21. North of Haynesville Roxana and Shell companies have assembled a block centering 3 miles northeast of the center of Haynesville production taking in acreage in Sections 3, 4, 5 and 6-23-7, Claiborne Parish, and Sections 7, 8, and 9-20-19 and 11 and 12-20-20, Columbia County, Arkansas. El Dorado interests are also building a block embracing Sections 1, 2 and 3-23-6, Claiborne Parish, and Sections 1, 2 and 3-20-18 and 6-20-17, Union County, Arkansas, the two blocks west and east, respectively, of Junction City.

W. G. Gray has derrick up for a 3,000 foot test on a 6,000 acre block adjoining the town of Bienville in Bienville Parish, location for the well being in Section 15-16-6 at the northeast corner of the townsite. Woodley & Collins' No. 1 Harp, the center of interest in wildcat activities 10 days ago, has retired into the background somewhat after failing to show anything but salt water on reaching the depth of the oil show in The Texas Company's No. 1 Myers and nothing whatever since passing it, 2,900 feet. The Harp test was 38 feet higher on the gas rock and 60 feet higher on the red beds than The Texas well, but since then the formations have been entirely different, including several sand bodies which all carried salt water. Since completing its second gas well in East Carroll Parish, Palmer Corp. has gone back into Catahoula Parish and released practically all the 40,000 acre block it had embracing the bed of Catahoula Lake and land along the north shore. Several shallow holes were drilled without encouraging results and the leases were surrendered, the company later going over the territory with torsion balance and re-leasing. Meanwhile several gas producing companies have approached Shell Petroleum Corp. with reference to getting parts or all of its holdings west and southwest of the two Palmer wells which had a total initial open flow of 82,924,000 feet at 1,050 pounds.

Woodmansee and others' No. 1 Bolinger, Section 9-22-11, Bossier Parish, is shut down at 3,100 feet waiting orders after testing salt water in the Cartersville horizon—Woodbine. Location is about 8 miles southeast of Cartersville gas and 5 miles south of production on the Manuel O'Garte grant in the Sarepta district of Webster Parish.

The Benson district of DeSoto Parish, regarded in some localities as a promising source of fuel and possibly oil led wildcat completions on a well gauging 2,750,000 feet of gas and a spray of oil from 15 feet of sand, total depth 3,059 feet, the test being Luke Case, trustee's, No. 1 Boatright in Section 3-10-13, which section has been location of all successful completions in that part of the parish. Benedum & Trees Oil Co.'s No. 1 Nicholson, Section 2-15-14, in the Wallace Lake district in the northeast corner of the parish, was abandoned as a dry hole at 2,975 feet but it is understood the company will move south and offset R. O. Roy's block centering around Section 1-13-14. Carter & Wingfield abandoned two wells in northeastern Union Parish, Nos. 2 and 3 Hudson in Section 6 and 7-23-1e, respectively, which had salt water at 2,190 to 2,278 feet.

NORTH LOUISIANA

Bienville Parish

W. G. Gray, trustee, has derrick up for No. 1 Snyder in the SE cor. SW NE Section 15-16-6 in the town of Bienville.

Bossier Parish

Woodmansee and others tested salt water at 3,100 feet in No. 1 Bollinger, Section 9-22-11, and shut down for orders.

Caddo Parish

Nemours Corp. No. 1 Ellerbe, Section 18-15-12, tested 50,000 feet of gas with salt water at 2,468 feet and is waiting orders. Humble Oil & Refining Co. and R. W. Norton, deepening No. 1 Fortner, Section 32-21-16, abandoned by Ohio Oil Co. two years ago at 3,072 feet, have cemented 6⅝-inch to protect the hole, total depth 3,100 feet. Simplex Oil Co. made location for No. 1 Dickson, 660 feet north and east of the center of Section 33-20-14. The Texas Company has rig up for No. 2 School Board in Section 16-15-12.

DeSoto Parish

P. J. Becker's No. 1 Tull, Section 23-12-15, lost a slip in the hole and will skid derrick to start a new hole, junking the first at 1,360 feet. Magnolia Petroleum Co.'s No. 1 Clements, Section 28-12-11, is drilling around 200 feet. R. O. Roy is drilling No. 1 Sample, Section 1-13-14, at 2,950 feet.

Grant Parish

Carter & Collins' No. 1 Hardtner & Tannehill, Section 9-6-1w, is drilling a "salt and pepper" sand at 2,125 feet.

Lincoln Parish

V. E. Shaw and others' No. 1 Voss, Section 1-20-3, is in gumbo at 2,620 feet.

Natchitoches Parish

S. D. McDaniels' No. 2 Clark & Morse, Section 23-5-6, tested 1,000,000 feet of gas with salt water in 8 feet of sand, total depth 2,536 feet. Robeline Oil & Gas Co.'s No. 1 Cassady, Section 7-8-9, is drilling chalk at 2,980 feet.

Monroe District

Morehouse Parish—Woodley & Collins' No. 1 Harp, Section 22-22-7, is drilling volcanic ash and hard sand at 2,938 feet.

Ouachita Parish—Phillips and others' No. 1 School, Section 16-16-4, is drilling at 3,520 feet.

Union Parish—Sundby and others' No. 1 Security, Section 6-23-1e, is shut down at 2,300 feet waiting orders.

Richland Parish

Austin & McDonald are drilling No. 2 Millsaps, Section 17-17-6, at 2,198 feet. North Louisiana Natural Gas Co. set 12-inch at 205 feet on No. 1 J. H. Hemler, Section 11-16-6, and 8-inch at 890 feet.

Sabine Parish

R. L. Gay is running core barrel on No. 2 Bowman-Hicks, Section 14-7-14, total depth 3,332 feet, and is drilling No. 3 at 1,250 feet.

ARKANSAS

Ashley County

Atlantic Oil Producing Co. is washing to bottom on No. 1 Bledso, Section 20-15-7, preparatory to going deeper, total depth 2,554 feet. J. G. Marcum's No. 1 DeYampert, Section 5-19-4, is reaming to bottom, total depth 3,312 feet.

Bradley County

Ohio Oil Co.'s No. 2 Southern Lumber Co., Section 19-16-6, is washing to bottom preparatory to making more holes, total depth 3,217 feet.

Columbia County

Helena Oil & Gas Co.'s No. 1 Pickler, Section 19-19-22, is shut down at 2,390 feet repairing rig.

Drew County

Ohio Oil Co.'s No. 1 Jerome Lumber Co., Section 13-15-4, is drilling at 3,254 feet.

Logan County

Arkansas Natural Gas Corp.'s No. 1 Hanna, Section 26-7-23, is in shale at 1,320 feet.

Nevada County

C. F. Steel's No. 1 Groves, Section 21-14-20, shut down at 1,005 feet since February 15, has resumed drilling and is in lime at 1,525 feet.

Ouachita County

Flaucher and others are drilling No. 1 Buck, Section 7-15-17, at 2,417 feet. Louisiana Oil Refining Corp.'s No. 1 Manley, Section 15-15-19, is drilling at 3,526 feet. Timberlake and others' No. 1 Wright, Section 25-14-18, topped the Nacatoch at 1,762 feet and is arranging for a drill stem test at 1,784 feet. Wesson and others are drilling at 1,575 feet on No. 1 Booth, Section 12-15-19.

Union County

W. M. Coats' No. 1 McDuffie, Section 32-19-17, is shut down at 142 feet. Hawthorne Oil Co.'s No. 1 Smith, Section 8-16-17, is drilling at 2,610 feet. Lion Oil Refining Co. set 130 feet of 10-inch and is drilling at 1,472 feet on No. 1 Stowe, Section 4-17-13. McDonald Brothers' No. 1 Mayfield, Section 29-19-15, is shut down at 2,210 feet. J. O. Moore is coring No. 1 Union Sawmill, Section 11-18-12, at 2,737 feet. Olvey and others are down 2,855 feet with No. 1 Cottrell, Section 22-19-17, in gumbo. Sundby and others' No. 1 Yocum, Section 29-16-17, is shut down at 2,610 feet repairing rig.

Washington County

Lincoln Lease Holding Co. No. 1 Lincoln Townsite, Section 30-15-32, set 10-inch at 80 feet and is drilling below 350 feet.

CALIFORNIA FIELDS

(Continued from Page 70)

the edge of the structure and while several attempts have already been made in this area to pick up deeper horizons work up to the present time has been unsuccessful. Officials of the Brownmoor are of the opinion that none of the previous deep exploratory wells were carried to a sufficient depth to afford conclusive tests. Two separate and distinct horizons are known to exist on the apex of the structure at Inglewood and with one or more believed to exist below these two the Brownmoor's deep work will no doubt be watched with interest, even though the property being tested out is not located any too favorably with respect to struc-

Northern California Wildcats

The coastal area, extending from Ventura to Port San Luis and comprising Ventura, Santa Barbara and San Luis Obispo Counties, is still undergoing an intensive exploration campaign and is being watched exceptionally closely. The most interesting well in this section is the Continental Oil Co.'s No. 1 Franklin, a wildcat located near Carpenteria in Santa Barbara County. This well has been in the limelight for several months and due to the exceptionally heavy gas pressure which has prevailed during the course of

work the Continental has found it necessary on several occasions to use almost pure barite to overcome excessive gas pressure. A second well is being rigged up for early work and natural gas from the initial test will be used as boiler fuel. The showing of No. 1 Franklin and the prolific tendencies of the Elwood Field have proven a powerful stimulant to prospectors with the result that practically every major California operator is either already wildcatting or has tied up potentially productive acreage at some point in Santa Barbara County. The General Petroleum is the latest to enter this area and drilling operations are already under way on the More ranch in Section 21-4-28. The Union has not yet undertaken any exploration work along the ocean front in Santa Barbara County but will probably do so, as it controls some very favorable acreage up on the mesa back of the government lighthouse. The Union's next activity in Santa Barbara County will be on the Buell ranch, 14 miles east of production. This new exploration work is the first effort to develop production in the immediate area until 1923. The Associated, Standard and Union have drilled test wells there before, but without satisfactory result. Records show that in 1901 the Associated Oil Co. drilled one hole to 510 feet and another to 1,300 feet without penetrating an oil formation. In 1902 the Union Oil Co. drilled to 2,500 feet and another well in 1915 was drilled to 4,572 feet. The last attempt was made in 1923 when the Standard drilled to 4,519 feet without finding anything promising.

Small Cost of Drilling

One of the most interesting features in connection with exploration work in Santa Barbara County is the relatively small cost of drilling a conclusive test in comparison with the usual run of prospect holes. The productive Vaqueros formation is encountered in this area at relatively shallow depths around 3,000 feet and the outcome of much work is decided one way or the other within 60 days after spud. This favorable factor has stimulated work and many tests are under way along the coast line. The Bankline Oil Co. was rotating a few days ago at 4,272 feet and while no evidence of production has been encountered may yet secure commercial production. The top of the Vaqueros sand was cored in this well at 3,290 feet but the bit passed into the Sespe a short time later. The American Oil Co. recently spudded in what may ultimately prove to be a very important test for the Summerland district of Santa Barbara County. This concern consummated a deal several weeks ago with the Submarine Oil Co. and a determined effort will be made to develop deep production in the Summerland Field, which has been yielding oil at shallow depths for a number of years.

The Shell is running three strings of tools in Santa Barbara County, one along the coast line approximately midway between Goleta and Gaviota and two in the vicinity of Guadalupe, very close to the boundary line between Santa Barbara and San Luis Obispo Counties. The company's test in the former area has drilled through the Vaqueros and is rotating ahead in the underlying Sespe. This project is in the Refugio Canyon, a little less than 10 miles west of Elwood where the Vaqueros is picked up around the 3,000-foot level. The Shell logged this formation a little below the 2,000-foot level but passed into the underlying Sespe formation at approximately 2,500 feet. The Shell has spent considerable time geologizing the Guadalupe and Betteravia district near Santa Maria in Santa Barbara County and has already drilled a series of post holes to determine any existing subsurface conditions which might tend to indicate the trend or existence of a possible structure. The Shell's initial test, located in Section 36-10-35, is northwest of Orcutt and about 8 miles west of Santa Maria. The Union, Standard and others have all taken protective acreage, but most of this is of no particular value because of the exceptionally large amount of acreage held by the Shell. The Standard has two wildcats under way in Santa Barbara County, but location was staked several weeks ago for still another. This company is concentrating its efforts at Point Conception with a second well under way in Tortuga Canyon. A third test will later be drilled at Point Arguello, about 10 miles northwest of Point Conception. San Luis Obispo County is expected to witness a revival of exploration work during the coming summer and several additional wildcats are scheduled to get under way to test a number of possibly productive structures. The Union has been running two strings of tools in the Huasna district for several months and while shallow tar sands have been logged for several hundred feet the anticipated light oil strata has not yet been encountered. These two wells are on separate structures which look quite favorable. The Marland has held considerable acreage in San Luis Obispo County and is reported to have recently consummated a deal for immediate development. These leases are rather favorably located on what is considered to be a promising structure.

GULF COAST

(Continued from Page 65)

strong is in rock at 1,907 feet. Humphreys Corp.'s No. 1 Tarbutton is drilling gumbo and boulders at 2,894 feet. Its No. 7-A Kirby is changing rigs. Rexal Oil Co.'s No. 1 McLean is drilling hard lime. Its No. 1 Shaw, completed several weeks ago as a pumper in a shallow sand at 2,260 feet, is pulling screen to deepen. Talbert & Markle's No. 1 Ellfrey is drilling lime at 4,479 feet. The latter operators also have started another deep test, No. 1 Schilling, drilling gumbo at 1,266 feet.

On the southwest flank, Yount Lee Oil Co.'s No. 4 Chambers is drilling gumbo at 2,430 feet. No. 5 Chambers is drilling gumbo at 1,422 feet. Sun Oil Co.'s No. 1 Chambers is drilling shale at 5,337 feet. Gulf Production Co.'s No. 1 Fisher fee is drilling hard sandy shale at 5,256 feet.

Mills Bennett Production Co.'s No. 1 Barber, north side of the dome, is drilling water sand at 4,317 feet.

Boling—Wharton and Fort Bend

Scott & Peck's No. 1 Armstrong, northeast side of the dome, which drilled to a total depth of 5,189 feet in sand and shale, is sidetracking at 4,600 feet. South Texas Petroleum Co. is building derrick for No. 2 Hyde-Fotjek. Sun Oil Co.'s No. 6 E. C. Farmer is drilling sand at 287 feet. The Texas Company's No. 1 Pleasants is drilling rock at 3,765 feet.

Raccoon Bend—Austin County

Humble Oil & Refining Co.-Valley Oil Corp.'s No. 3 Urban has set screen to test oil sand at a total depth of 3,360 feet. Two other tests are waiting casing cement to set to test. These are No. 3 Hardie at 3,216 feet and No. 3 Roy Thompson at 3,021 feet. No. 1 Mueller, which blew in early in the week as a 15,000,000-foot gasser at 1,847 feet, opening a new sand, has been killed and will be deepened to the oil pay level. No. 1-D Grawunder, 9,000-foot south extension test, is drilling hard sandy shale at 2,920 feet. No. 2 Ollie Wilson is drilling shale and lime at 905 feet. No. 4 E. B. Wilson is drilling shale and lime at 1,090 feet. No. 1 Kalieszewski is drilling sandy shale at 90 feet, having just started operations. No. 2 Saunders is fishing at 2,969 feet. No. 1 Buchanan is drilling sand at 3,008 feet. No. 2-A Washington is drilling shale and lime at 2,286 feet. No. 1-B Washington is drilling shale at 130 feet. No. 1 Helmuth is rigged up.

DeWalt—Fort Bend County

Humble Oil & Refining Co.'s No. 7 Sugarland is drilling shale and lime at 2,214 feet. No. 3 Camp is drilling shale and lime at 3,238 feet. No. 4 Camp is a location. No. 2 Nelson is waiting on cement to set to test sandy shale showing oil at 3,487 feet. No. 5 Brazos is drilling sandy shale at 3,438 feet. No. 6 Brazos is drilling shale and boulders at 1,068 feet. No. 1-B Deatherage is rigged. No. 4 Hamner fee is a derrick and Nos. 1, 2 and 3 are locations.

Humble—Harris County

Humble Oil & Refining Co.'s No. 1 Williams, south side of the field, is drilling gumbo at 3,370 feet. South Texas Petroleum Co.'s No. 4 Morris is drilling gumbo at 834 feet. The Texas Company's No. 39 Stevenson is drilling shale at 5,110 feet. The Texas Company's No. 262 Landslide is rigged up and No. 263 is a location.

Blue Ridge—Fort Bend County

Gulf Production Co.'s No. 7 Invincible, east side, is drilling shale and lime at 4,045 feet, drilling deeper after testing salt water at 3,934 feet. No. 17-B Blakely is drilling shale at 3,633 feet. Sinclair Oil & Gas Co.'s No. 4 Davidson is sidetracking at 3,546 feet. South Texas Petroleum Co.'s No. 1 Blakely is cutting screen to deepen from 3,941 feet.

Navarro Oil Co.'s No. 6-B Robinson, northwest side of the dome, tested salt water in sandy shale at 4,045 feet and is drilling deeper in shale and lime at 4,184 feet. Humphreys Corp.'s No. 5 West-Schenck and Moody Corp.'s No. 6 West-Schenck on the south side of the dome, remain standing at previously reported depths.

Pierce Junction—Harris County

Anderson & Plummer's No. 5 Whitehead, on the north side of the field, has drilled into oil showing sand to 4,755 feet and has set 6⅝-inch casing at 4,718 feet to test.

On the recently opened southwest side, Pure Oil Co.'s No. 1 Herman is down 4,090 feet and has set 8¼-inch casing at 3,850 feet. The latter offsets to the north Moody Corp.'s No. 4-B Whitehead, so far the only producer on the southwest. Offsetting that well to the southeast, Gulf Production Co.'s No. 29 Taylor is drilling sand and boulders at 694 feet. Harvey Smith and associates' No. 2 Herman on the 25-acre tract to the north of Pure's 25-acre tract, is drilling gumbo at 2,600 feet, and offsetting that tract to the north, Rio Bravo Oil Co. has made location for its second test, No. 15-A Settegast, 150 feet west of No. 13-A, completed the past week as an 1,800-bbl. producer. No. 13-A offsets Harvey Smith's No. 1 Herman.

Rio Bravo Oil Co. also has made location for No. 14-A Settegast, which is in the proved area to the north on the west flank. It is 400 feet north of No. 12-A Settegast, completed during the week flowing an estimated 2,500 bbls. daily. Rio Bravo's No. 7-B Settegast, a former well deepened to 4,681 feet, was bailed dry and is pulling screen to deepen.

On the extreme south side of the dome, South Texas Petroleum Co.'s wildcat, No. 1 J. H. Myers, is drilling shale at 3,219 feet.

Navarro Oil Co. and Texas Exploration Co.'s No. 15 Dooley on the northeast flank, is spudding. Navarro Oil Co. and Humble Oil & Refining Co.'s No. 3 Dooley, a former well, is rigged up to work over. Navarro's No. 1-B Cain, also a former well, is rigged up to work over. Gulf Production Co.'s No. 3 Fitzsimmons-Hamman is drilling gumbo at 1,278 feet. Gulf's No. 8 Cain, east side, is drilling hard sand and lime at 3,693 feet and its No. 28 Taylor is drilling hard sand at 4,235 feet.

Moody Corp.'s No. 3 Hume, north side, a work over, is drilling at 4,179 feet. The latter's No. 1 Boyles & Minchen, a former well, is rigging up to work over. Smith and associates' No. 1 Parson, a workover, is bailing to test at 4,315 feet.

Liberty—Liberty County

Humble Oil & Refining Co.'s No. 3-B Reviere, newly opened shallow sand area, tested a small amount of oil and salt water at 1,855 feet and is pulling screen to deepen. The latter's No. 4-B Reviere is bailing to test at 2,347 feet. Abercrombie & Harrison's No. 1 Reviere, same area, is drilling gumbo at 1,783 feet. Fort Bend Oil Co.'s No. 2 Reviere is rigging up to pump. Navarro Oil Co.'s No. 1 Baldwin Community is waiting cement to set to test at 3,076 feet and its No. 4 same tract is drilling sandy shale at 1,138 feet. The Texas Company's No. 20 Staiti, also same area, is drilling sticky shale and sand at 1,425 feet and Vacuum Oil Co.'s No. 11 Barrett is drilling water sand at 2,335 feet. Mecom Oil Co.'s No. 1 Barrett is drilling at 2,696 feet. J. W. O'Brien's No. 1 Baldwin is spudded. Liberty Oil & Sulphur Co.'s No. 1 Monroe is drilling gumbo at 687 feet and its No. 1 Pickett is drilling sand and shale at 1,057 feet.

Sun Oil Co.'s No. 42 Mitchell is drilling at 2,279 feet and its No. 43 Mitchell is drilling at 812 feet.

On the northwest flank of the dome, The Texas Company's No. 5 Green is drilling sand and shale showing oil at 3,145 feet. The latter's No. 3 Pickett is reaming at 4,733 feet.

Nash Dome—Brazoria County

Rycade Oil Corp.'s No. 23 Wisdom is coring sand at 4,625 feet.

Big Creek—Fort Bend County

Gulf Production Co. late in the week was swabbing No. 18 Davis, a work over, which is in a sand showing oil at 3,687 feet. This company also has made location for No. 53 Davis and is moving the rig from No. 52, completed the past week as a small producer. Navarro Oil Co. has rigged up for two Big Creek tests, No. 4 Davis and No. 3 Hausler. The Texas Company's No. 5 Wheat is drilling gumbo at 1,833 feet.

Orange—Orange County

Sinclair Oil & Gas Co.'s No. 5 Granger, a work over, which blew out last Thursday while drilling at approximately 2,200 feet, is rebuilding derrick which was destroyed. Tillery Oil Co. has abandoned its No. 3 Tasco. The well, a work over, tested salt water at 3,512 feet. Brownie-Babbett Oil Co.'s No. 8 McLean is being rigged up to deepen.

Hardin County Domes

Acorn Oil Co.'s No. 69 Paraffine, Batson, tested salt water at 1,143 feet and is to be abandoned. Capitol Oil Co.'s No. 11 Hodges is drilling at 1,662 feet. Gulf Production Co.'s No. 51 Tarver, Sour Lake, a former well deepened to 2,468 feet, was bailing late in the week. Lake View Oil Co.'s No. 2 B. & E. is drilling at 687 feet and Minor Oil Co.'s No. 86 fee is drilling at 689 feet. Rio Bravo Oil Co.'s No. 107 B.B.B.&C., Saratoga, is drilling sand at 800 feet. Weldon Oil Co. has started drilling in another shallow test, No. 18 Hooks. Gulf Coastal Oil Co.'s No. 1 Patton is drilling at 1,781 feet.

Goose Creek—Harris County

Humble Oil & Refining Co.'s No. 75 Simms-Smith, deep wildcat north of the field, is in sandy shale at 4,271 feet where 9⅝-inch casing has been cemented. Russell Farrell's No. 5 Gillette was bailing late in the week to test at 1,996 feet. C. T. Rucker has a rig up for No. 1 Jones.

Spindletop—Jefferson County

Unity Oil Co.'s No. 100 McFaddin, located between the shallow production area and the deep production of Yount Lee Oil Co. on the south, is bailing to test a sand showing oil at a total depth of 1,424 feet. Yount Lee Oil Co.'s No. 29 McFaddin, which tested salt water at 4,624 feet, is drilling deeper in shale and lime at 4,856 feet. This company's No. 94 McFaddin is in sand at 5,076 feet. No. 97 McFaddin is waiting cement to set to test at 4,774 feet. No. 100 McFaddin is drilling sand at 2,976 feet. No. 101 McFaddin also has started drilling and is in gumbo at 925 feet.

Yount Lee Oil Co.'s No. 5 Davis tested salt water at 3,446 feet. No. 3 Gladys City is drilling shale and lime at 4,957 feet. No. 76 Gladys City is in sand at 5,683 feet. No. 86 Gladys City is in gumbo at 2,479 feet and No. 87 Gladys City is in gumbo at 2,117 feet. No. 88 Gladys City is drilling gumbo at 1,556 feet.

SOUTH LOUISIANA FIELDS

Hackberry—Cameron Parish

Calcasieu Oil Co.'s No. 6 Valery, East Hackberry, which had reset screen after deepened to 3,935 feet, was bailing for another test late in the week but was showing salt water. It also tested salt water at 3,878 feet. This company's No. 6 Dorion is rigged up.

At Old Hackberry, Cameron Oil Co. and Rycade Oil Corp.'s No. 4 Duhon is drilling gumbo at 3,946 feet. McClain Oil Co.'s No. 1 Ellender is drilling sand and lime at 2,395 feet. Progressive Oil Co.'s No. 1 Little drilled to 1,102 feet in gumbo but is standing. Sun Oil Co.'s No. 3 Vincent is rigged. Sunshine Oil Co.'s No. 1 Benoit is to be abandoned after drilling in salt to 2,101 feet. Yount

Lee Oil Co. has derricks up for two more tests, Nos. 2 and 3, on its Kaough tract. Rycade Oil Corp. and Humble Oil & Refining Co.'s No. 1 Gulf Land has been abandoned in salt topped at 4,267 feet. It drilled to 4,336 feet. These operators' No. 2 Gulf Land is coring at 3,797 feet. The latter two tests are on the west side of the dome, the others being on the south.

Lockport—Calcasieu Parish

Shell Petroleum Corp.'s No. 1 Miller is drilling pink gummy shale with sand streaks at 4,153 feet. The Texas Company's No. 1 Moss is rigged up. Vacuum Oil Co. and Gulf Refining Co.'s No. 13 Miller, a work over, is running tubing at 4,396 feet. No. 15 Miller and also No. 24 Miller are rebuilding derricks, wrecked in the recent windstorm. No. 5 Bayou D'Inde is drilling hard, sand rock at 3,856 feet. No. 6 Bordages is in sand showing oil at 3,806 feet and has set 7-inch casing at 3,785 feet to test.

Jennings—Acadia Parish

Abshire-Bolyard Oil Co. has a rig up and is starting drilling in No. 5 Syndicate fee. Fred Getty also has a rig up for No. 2 Jennings-Clemont. Yount Lee Oil Co.'s No. 4 Crowley is drilling sand at 6,427 feet.

Bayou Bouillon—St. Martin Parish

Rycade Oil Corp.'s No. 7 Bouillon fee is coring at 3,495 feet. This company's No. 3 Louisiana State drilled into a cavity at 3,315 feet and is sidetracking at 1,700 feet.

Miscellaneous Fields

At Markham, Matagorda County, Rycade Oil Corp. and Humble Oil & Refining Co.'s No. 6-A Kountze is in a rich appearing oil sand at 3,751-97 feet and has set screen to test. West Production Co.'s No. 1 Myers, same field, is drilling sand rock at 3,120 feet. Gulf Production Co.'s No. 19 Moore, Orchard, spudded. Sun Oil Co.'s No. 2 Kovelcik, North Dayton, is drilling shale at 2,305 feet. Sinclair Oil & Gas Co.'s No. 6 Norton is drilling gumbo at 1,131 feet after setting 10-inch surface casing.

Pure Oil Co.'s No. 7 Yount Lee Oil Co., Sweet Lake, Cameron Parish, is drilling shale and sand at 5,013 feet. This company's No. 8 Yount Lee Oil Co., same field, is drilling hard sand and lime at 5,381 feet. Gulf Refining Co.'s No. 4 United Land Co., Sorrento, Ascension Parish, is drilling at 1,259 feet. This company's No. 14 Lutcher-Moore, Starks, Calcasieu Parish, is drilling at 4,261 feet; No. 15 at 4,012 feet and No. 13 Industrial at 3,896 feet. Yount Lee Oil Co.'s No. 4 Louisiana Petroleum Co., Anse La Butte, St. Martin Parish, is drilling sand at 5,197 feet. Union Sulphur Co.'s No. 742 fee, which tested salt water at 2,877-84 feet, is pulling screen to deepen. No. 744 fee has been rigged up. No. 736 fee, which tested salt water at 5,100 feet, is pulling screen .

MISCELLANEOUS WILDCATS

Texas

Austin County—Flanigan & Mewis' No. 1 Mewis, Raccoon Bend district, is drilling shale at 2,377 feet.

Brazoria County — Shell Petroleum Corp.'s No. 4 Allen, a former well being deepened, is trying to pull stuck drill stem after drilling to 5,154 feet. Empire Gas & Fuel Co.'s No. 3 Brock, Stratton Ridge, has spudded. Humphreys Corp.'s No. 1 Bryan, Bryan Mound, has drill stem stuck with bottom of hole at 3,254 feet.

Chambers County—Pure Oil Co.'s No. 2 Mayes, Lost Lake Dome, has spudded and at 39 feet has set 18⅝-inch surface casing. No. 3 Mayes is rigged.

Fort Bend County—Gulf Production Co.'s No. 11 Trone, Long Point, is drilling lime at 1,057 feet. South Texas Production Co. has a rig up for No. 1 Winkleman at Needville. This is the second test on this prospective dome, No. 1 Hartfield having been abandoned in heaving shale, testing salt water, at 6,889 feet.

Harris County—Humble Oil & Refining Co.'s No. 1 Irvin, second Mykawa test, is drilling gumbo at 1,215 feet. Humble's No. 5 Warren at Hockley is drilling hard sand at 3,836 feet. Baldwin and associates' No. 1 Kitzman, Cypress, is drilling sticky shale at 3,765 feet. Little York Oil Co.'s No. 1 Davis, Little York, is drilling shale at 3,100 feet. Paxton & Pundt's No. 1 Brown, Wooster Townsite, is drilling shale at 936 feet.

Jackson County—The Texas Company's No. 1 Moore, D.&G.N. Survey No. 311, 16½ miles north of Edna, is shut down temporarily at 3,644 feet while changing rigs. The test has been drilled so far by gasoline but will be completed with steam.

Jefferson County — Gulf Production Co.'s No. 6-A Bordages, Fannette, is drilling hard shale and lime at 5,112 feet. No. 7 Bordages is drilling hard sand at 4,897 feet and No. 11 Thomas sticky shale at 4,351 feet. Shell Petroleum Corp.'s No. 1 Heisig, T.&N.O. Survey. No. 86 Hampshire is drilling sticky gumbo at 880 feet. The Texas Company's No. 1 Pipkin, Big Hill, is reaming at 4,733 feet to set casing. This test tried to blow out while drilling at a total depth below 5,900 feet. Yount Lee Oil Co.'s No. 1 Nona Mills, Hillebrandt Survey, is drilling shale and lime at 5,705 feet. Vacuum Oil Co.'s No. 1 Herbert-Broussard, T.&N.O. Survey No. 208, is waiting completion of a road to the location.

Liberty County—Humble Oil & Refining Co.'s No. 4 Sterling, Moss Bluff, is drilling hard sand at 3,116 feet. The Texas Company's No. 2 Davis, Davis Hill, is drilling sand stone at 4,441 feet. Union Exploration Co.'s No. 2 Esperson, Sheeks, is waiting casing cement to set to test oil showing sand at 5,562 feet.

Matagorda County—Crossland and associates' No. 1 Hawkins, Sheperds Mott, is drilling sand rock at 4,640 feet. Griffith and associates' No. 1 Culver, Citrus Grove, is drilling gumbo at 2,121 feet.

Orange County—The Texas Company's No. 1 Kuhn, Terry, is drilling sandy shale and lime at 2,865 feet.

Waller County—The Texas Company's No. 1 Young is drilling sandy shale at 2,388 feet.

South Louisiana

Ascension Parish—Gulf Refining Co.'s No. 1 Belle Helene, Darrow, is drilling at 4,421 feet. This company's No. 14 United Land at Sorrento is drilling at 1,261 feet.

Cameron Parish — Shell Petroleum Corp.'s No. 9 Watkins, Black Bayou, is bailing and swabbing and from a sandy shale at 981 feet oil is rising in the hole at the rate of 32 bbls. daily. The hole probably will be deepened. No. 6 Watkins is in blue shale at 4,507 feet where 9⅝-inch casing has been cemented on bottom. The Texas Company has a rig up for No. 3-A Calcasieu Lake, Calcasieu Lake Dome.

Iberia Parish—The Texas Company's No. 3-A Vermillion Bay, Vermillion Bay Dome, is drilling rock at 4,600 feet. This test has had rock from above 4,000 feet.

Iberville Parish — Shell Petroleum Corp.'s No. 3 Wilbert, White Castle, is drilling sandy shale and lime at 4,215 feet. Standard Oil Co. operations at Bayou Blue are unchanged over previous reports.

Terrebonne Parish—The Texas Company's No. 1 Lake Barre is in cap rock cavity at 747 feet and losing returns. This company's No. 1-A Dog Lake Bayou is standing at 310 feet. No. 1-B Bay Coon Road is rigging up. No. 1-A Timbailer Bay is a derrick.

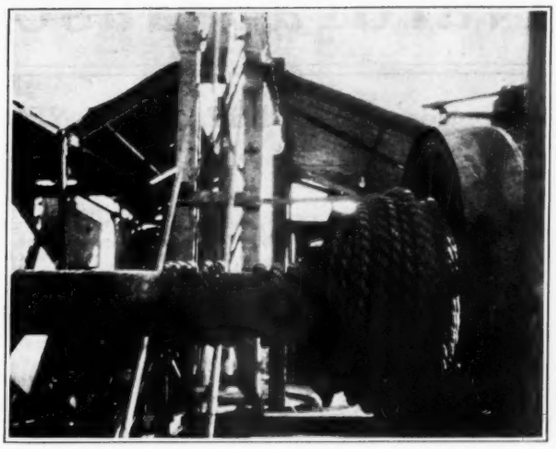
Miscellaneous Parishes — All wildcats not included in the various parishes are standing or have made practically no hole during the week.

JAMES FINK DIES

OIL CITY, Pa., Apr. 20.—James Fink, 58, stricken with heart trouble while driving his car, died before aid could be summoned. He was employed as a gauger for the National Transit Co., but was pensioned four years ago.

W. E. HEATHCOTE DIES

FRANKLIN, Pa., Apr. 20.—William E. Heathcote, former vice president of the Galena Signal Oil Co., aged 65, died suddenly in St. Petersburg, Fla., from a paralytic stroke. He married Josephine Sibley of this city after coming to Franklin from Omaha.



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Natural Gasoline Manufacture

Costs to Consider When Installing Auxiliary Drives

By Fred C. Loomis*
Engineer, Standard Gasoline Co.

Auxiliary power in natural gasoline plants is used chiefly for the pumping of water, absorption oil and gasoline. Therefore this discussion of the various types will deal with pumping units. The most common types of pumping units are the direct acting reciprocating steam pump, the noncondensing steam turbine driven pump, the electric motor driven pump and the gas engine driven pump.

The direct acting steam pump is hard to equal in the essential qualities of flexibility, simplicity and reliability, when a proper selection is made. It is, however, a very inefficient machine thermally.

The steam turbine and centrifugal pump are well suited to each other and combine to form an efficient, flexible compact unit and development of the turbine has made this type of drive quite economical. The economy is most apparent in larger sizes and when using higher steam pressures. The steam turbine gives a great factor of safety for overloads and is flexible in that its speed can be easily altered by adjusting the governor.

The electric motor is the simplest driver for both centrifugal and power-driven displacement pumps. The motor must be selected properly for the pump drive, because it will not stand a continuous overload without deteriorating and if selected too large, power will be paid for that is not used; this of course only where power is purchased on motor rating. The extreme simplicity and absence of fire hazard make the squirrel-cage motor most desirable for gasoline plant work, although the slip-ring motor may be necessary from the standpoint of low starting current.

The gas engine, chiefly due to its low operating cost is a very desirable driver. A gas engine should be so selected that its power demand does not exceed 90 per cent of its rated power. For gasoline plant auxiliary work it is probably more economical in the long run not to exceed an 80 per cent load factor. Gas engines are not very flexible as to speed variations, but are very adaptable to various types of pump drives, it being feasible to direct connect through-geared transmissions, to drive lineshafts from which any combination of pumps may be belted, or to drive pumps directly from engine by belts.

Any comparison of these types of drivers, with a view to selecting the type with the greatest overall economy, involves more than the mathematically computed cost of operation summated from the items of fuel, lubricating oil, water, interest, repairs, operating labor, etc. There are irreducible items such as, standby charge, salvage value, trining and experience of the operating organization with the various types, etc.

Difficulty of Task

Even the more or less tangible items attributing to cost are not definitely known in many cases. How much does our fuel gas cost? We may know today, but will we know what it will be worth in the same field in a year or even six months from now? What will be the repair costs of a particular installation?—and by this I mean the material and labor costs necessary to maintain the equipment in 100 per cent condition? We may have accurate records of costs for some types of drivers, but we do not know how efficient our operating and repair crews will be with a different type.

There is so much data, influencing a

(Continued on Page 137)

*The California Natural Gasoline Association.

ESTABLISH NEW PEAK IN GREATER SEMINOLE NATURAL GASOLINE OUTPUT

Natural gasoline manufacturers in the Greater Seminole area of Oklahoma are now producing more gasoline at their plants than during any other period in the history of the field. The Oil and Gas Journal's monthly check on production made the latter part of last week showed a daily production of 1,137,600 gallons. This is an increase of 83,400 gallons daily over the daily production for the same period in March and 38,000 gallons daily higher than the previous peak in January.

The increase for the past month comes largely from the smaller manufacturers three of the large manufacturers showing small decreases. The Amerada, Barnsdall, Crosbie and Moran, Empire, Independent, Magnolia, Moran and Gillespie, M. F. Powers, Shell, Skelly and Victor were the manufacturers whose April production will be higher than in March.

This increase in production comes despite the fact that warmer weather usually means a decrease in production due to evaporation losses and the production of lower gravity gasolines. In making their reports several companies stated that they had been able to adjust their plant operations to the proration agreement in effect in Seminole without the heavy losses experienced in February and March. Three companies reporting lower production said that the gas supply had been reduced at one or more of their plants.

The production by pools shows that large increases have materialized during the past month in the Mission and the St. Louis-Pearson Pools. These are the latest crude oil producing pools of the Greater Seminole area and there has been a gradual increase in the quantity of gas available for the new plants. It is probable that additional increases will materialize in the Mission Pool.

No new plants started up during the past month. The Victor Gasoline Co. expects to increase the production of its South Little River plant to 16,000 gallons daily. The plant at present is producing 8,000 gallons daily from one well. Three additional wells will be completed before the end of the month.

NATURAL GASOLINE PRODUCTION IN GREATER SEMINOLE

	Total	Seminole City	Bowlegs	Earlsboro	Little River	St. Louis-Pearson	Maud	Mission
Amerada Pet. Corp....	40,500	.....	9,500	11,000	.....	.....	20,000	.....
Barnsdall Oil Co.....	37,000	.....	.....	19,500	.....	.....	.....	17,500
Carter Oil Co.†	153,000	100,000	8,000	.....	45,000	.....	.....	.....
Crosbie & Moran.....	28,000	.....	.....	28,000	.....	.....	.....	.....
Cushing Ref. & Gas Co.	34,000	.....	.....	.....	15,000	19,000	.....	.....
Empire O. & R. Co.* ..	107,800	27,500	48,000	.....	21,000	.....	11,300	.....
Forrest E. Gilmore Co.	38,000	.....	4,000	.....	34,000	.....	.....	.....
Gilmore Producing Co.	2,900	.....	.....	.....	.....	2,900	.....	.....
Gypsy Oil Co.....	112,000	.....	.....	.....	67,000	.....	.....	45,000
Independent O. & G. Co.	55,000	5,000	.....	.....	35,000	.....	.....	15,000
Magnolia Pet. Co.....	36,600	.....	.....	7,700	.....	29,000	.....	.....
Moran & Gillespie.....	27,000	.....	.....	.....	.....	27,000	.....	.....
Pure Oil Co.....	39,000	17,000	11,000	.....	.....	11,000	.....	.....
Powers, M. F.	15,000	.....	.....	.....	.....	15,000	.....	.....
Shell Pet. Corp.	85,700	.....	5,000	.....	.....	61,700	.....	19,000
Sinclair O. & G. Co....	226,000	90,000	80,000	6,000	.....	50,000	.....	.....
Skelly Oil Co.....	44,500	.....	.....	37,000	.....	.....	7,500	.....
Victor Gasoline Co.....	55,500	7,500	20,000	20,000	8,000	.....	.....	.....
Total 1,137,600		247,000	185,500	129,200	225,000	215,600	38,800	96,500
Production March 18..1,054,200		253,000	177,500	118,500	216,700	165,000	62,000	61,500

*Includes production of Indian Territory Illuminating Oil Co. †Includes 42,000 production in Searight Pool.

HOPE COMPANY NOW HAS TWENTY OPERATING UNITS

The Hope Construction & Refining Co., the largest producer of natural gasoline east of the Mississippi River, now has 20 plants in operation with a combined capacity of 139,600 gallons daily. In addition the company has two plants with a capacity of 2,500 gallons daily which are shut down.

Fourteen of the twenty-two plants are located in West Virginia, where the company has large gas properties. These West Virginia plants have a combined capacity of 112,100 gallons daily. Three small plants are located in Ohio and the remainder in Pennsylvania.

The Hastings plant located at Pine Grove, West Virginia, is the largest of the company's plants. It has a capacity of 40,000 gallons daily. At Brave, Pa., the company has a plant with a capacity of 20,000 gallons daily. The Hope company in addition to the regular grades of natural gasoline is a large manufacturer of special products including liquefied gas.

INCREASE PLANT OUTPUT

The Signal Hill Gasoline Co., which is owned 100 per cent by the Richfield Oil Co. of California, has increased its natural gasoline production to 110,000 gallons daily. The company, which operates all the plants of the Richfield company, through additions and the combination of operations has increased its output and is now one of the large manufacturers on the West Coast.

At present the company has seven plants operating. Three of these are in the Signal Hill Field and one each in Maricopa, Huntington Beach, and Seal Beach. H. R. Linhoff is general superintendent of plants and C. B. Garretson is sales manager.

COMMITTEE PREPARES PAPER

George L. Ratcliffe, president of the California Natural Gasoline Association, has appointed the following California manufacturers to prepare the special paper for presentation at the annual meeting of the Natural Gasoline Association of America: W. W. Robinson, Jr., The Texas Company; K. S. Megruder, General Petroleum Corp.; J. C. Burks, O. C. Field Gasoline Co., and E. R. Cox, The Texas Company.

The paper, which will be presented at the meeting by Mr. Robinson, is entitled, "The Practical Application of Gas Analysis to the Operation of Gasoline Plants." The annual meeting, as announced last week, will be held at the Mayo Hotel, Tulsa, May 21-23.

BUILDS SECOND PLANT

The Skelly Oil Co. is building a second plant on the Shaffer ranch of the Texas Panhandle. The new plant, which will be completed in 60 days, will have a capacity of 16,000,000 feet of gas. It is located south of the present plant which is being enlarged so that it will have a capacity of 25,000,000 feet of gas daily.

A PRACTICAL SUGGESTION

CASINGHEAD CONTRACT

A contract on the gas purchased for the gasoline plant is one of the most important parts of industry. The contract must be fair and equitable to both buyer and seller and the construction of the various requirements must be reasonably interpreted. The contingencies which arise are comparatively simple and can usually be settled satisfactorily if both parties are willing to be fair. The seller sometimes relies entirely upon the advice of his pumper or the buyer may be influenced by information given to him by his plant men, both of whom may be subject to very personal prejudices. Differences discussed by open-minded parties are usually settled to the satisfaction of all concerned.

Local conditions make contracts slightly different, so that the general outline given below is not always applicable.

Duration. The contract usually is effective for three or five years, or during the entire life of the oil and gas lease.

Pipe Lines. Pipe lines are extended to the wells and gas traps of the seller at the expense of buyer. The residue gas lines are laid to the boundary line of the seller's property.

Suitable Gas. Gas too lean in gasoline content or too small in volume to allow profitable handling is not required to be taken by buyer.

Vacuum. Buyer is required to furnish vacuum equivalent to that maintained on offset wells. The degree of vacuum is regulated and controlled by the seller.

Flush Gas. The buyer is not required to take and pay for flush gas. However, seller can dispose of this gas with the understanding that buyer has first call on all gas.

Lease Operation. It is understood lease of sellers is operated primarily for the production of oil and the taking of gas is subservient to said oil operations.

Residue Gas. Sufficient volume of residue gas must be returned to seller for operation of lease. Surplus gas sales are divided equally between buyer and seller after an allowance to buyer of 1½ cents to 2 cents for pressures of 75 pounds or under and 2 cents to 4 cents for pressures above 75 pounds. This allowance to cover gathering, boosting and other operation charges.

Meters. Meters are installed and maintained by the buyer.

Price. Price paid varies some with richness and location as regards railroad. It varies from 15 per cent to 33⅓ per cent of the gasoline value of gas, the gasoline value being determined by a physical test, the selling price of the gasoline and the daily meter readings.

If contract covers gas produced on government restricted lands, it must be approved by the Department of the Interior.

Practical suggestions by those connected with the construction and operation of natural gasoline plants are invited. Payment will be made as soon as suggestions are accepted. Address all communications to the Natural Gasoline Department, The Oil and Gas Journal, Tulsa.

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Chicago Area Refinery Market Firm

Kerosene Weaker Due to Heavy Rains Over Territory Which Delayed Plowing. Refiners May Advance Gasoline Prices

By John B. Waldo

CHICAGO, Apr. 22.—The gasoline spot market was quiet today as contract shipments are sufficient for the present requirements of the jobbing trade. The refinery market was firmly held at 7½ cents with some good material still offered by marketers from their earlier purchases at one-eighth of a cent below the regular refinery market price. The expectation was that very shortly and possibly late today some refiners would advance their price to 7⅝ cents. In fact, it was reported that some had done so, but an investigation could not find this quotation regularly made by any of the major refineries. There were quite a number of inquiries for prices over May, and one quotation on 200 cars for delivery before June 1 was made of 8 cents for U. S. Motor. This price was made by a Group 3 refinery. Some North Texas plants have quoted 7¾ cents to June 1, but not for so many cars. Kerosene was decidedly easier. Refiners quoted 6⅜ cents and buyers stated that they could purchase the 41-43 material at 6¼ cents from both refiners and marketers, the latter buying at 6⅛ cents. One cause for the weakness shown in kerosene was the heavy rains late last week over much of the territory. The fields had dried so that plowing was just starting in many localities when the heavy downpour of Friday came to set the work back at least another week.

Gas oil was easy. One rather large contract was closed Saturday at a price stated to have been 2 cents West Texas refinery. Local bidders who offered zero gas oil at 2¼ cents Group 3 did not secure the contract. There was only a light inquiry for heavy fuel oil and more desire to move stocks was evidenced by refiners. It is too early for the inquiries from buyers who purchase just before the beginning of their month and very little demand from irregular buyers was noted. The market had an easy tone for all grades of fuel oil but particularly for the heavy fuels.

Increased Consumption Shown

The movement of gasoline continues to reflect the increased consumption. While some jobbers report that their business is only a little better than a year ago at this time, most of the distributors, especially those whose territory is so large that they are independent of merely local conditions, state that their gallonage is materially larger than last year.

Stocks of refiners are somewhat larger than a year ago, according to reliable reports. What is of more importance is that in this territory jobbers are carrying larger stocks.

Avoid Handling Inferior Product

Last summer during the period of greatest demand when so many stations in this territory were not able to maintain a constant supply there was much inferior product sold to jobbers, not because it was what they wanted, but because it was the best that they could buy. This is one reason why jobbers have been accumulating stocks of gasoline. The larger integrated companies have been increasing the quantity of gasoline at their stations. One reason recently given by a fairly large distributor for not buying any more kerosene was he wanted to use the tanks for gasoline.

Some of the larger jobbers have purchased outright for storage. Others are taking in a larger quantity on their contracts than their monthly sales amount to. It is the time of the year when gasoline stocks at the stations should and do increase and this season the reasons for such an increase are stronger and more clear than in most years.

A review of the situation made a year ago listed 317,000 filling stations in the United States. If each station is now carrying 200 gallons more gasoline in storage than it did two months ago, this would mean an increase in storage alone of 63,000,000 gallons.

The real storage is in the bulk stations. It must be assumed that the distributors, large and small, are now carrying in stock in preparation for the increasing demand possibly an amount equal to the actual consumption during the past month.

Stocks Will Be Replaced

These stocks will be replaced just as fast as they are drawn against during the season, being held merely as a reserve until after the season is past, unless something unusual occurs to bring an element of uncertainty into the situation.

The refinery shipments have been increased more rapidly than consumption during the time when the stocks were being accumulated. It is a regular annual occurrence, but this year it seems to have been especially pronounced.

The market for gasoline was strong all of last week. The spot business was not active, but the contract business was large practically all contract customers ordering freely and for the full amount on their contracts. There is an evident disposition to carry a good supply and even if the present consumption is not up to the quotas on contracts the full amount is being taken. This is one of the strongest features in the situation.

Jobbers do not seem to want simply to have the gasoline coming to them, they want to have it in their own tanks if they can possibly arrange to do so. They remember how some of the largest refining organizations were delayed in making shipments of gasoline last summer and again of furnace oils last winter and believe that a bird in the hand is worth two in the bush.

Contracts Good for Several Months

A large number of contracts were closed last July and August and these have several months to run. It is more and more evident that the marginal contract is not to be readily displaced and all that the jobber wants is a fair margin under the contract. Right now there is little variation in the contracts being offered and some of the most recent additions to the list of refiners are holding as firmly to the regular terms as those who have been longest in the business. There is no real need now to cut the terms in any way. What the jobber is after today is an assurance that he will be supplied regularly with dependable gasoline.

Early in the week the refinery price for U. S. Motor gasoline was advanced to 7½ cents, Group 3 basis, and there was little variation from that price after Monday. Spot sales were fairly liberal for the time of the year. Conditions have been good so far this month. Some business was done in the higher gravities but the greater part of the movement was in the 58-60 437 endpoint, that is, the full U. S. Motor grade.

Some refiners make a cut that is a 58-60 440 endpoint for which they receive a quarter of a cent lower price and this is a good material in some states and sells widely.

Meets Local Regulations

The 60-62 437 endpoint is also favored by some and has special territories where it complies with local regulations. This sold last week at 7½ to 7⅝ cents but had a strong tone owing to the strength in natural gasoline. These gasolines are practically slight variations from the U. S. Motor grade.

Several of the major companies are now selling regularly through their own stations a gasoline that is virtually equivalent to the 60-62 400 endpoint gasoline and some supply this to their contract customers at the regular price of U. S. Motor gasoline. Usually the product has good antiknock qualities and meets the requirements of the high compression motor. It is safe to say that more than 50 per cent of the cars in daily use in the larger communities have high compression motors and require an antiknock gasoline.

The demand for natural gasoline was rather more active and prices were strong with some advances. In Ohio there was an advance of 1 cent a gallon in the tank wagon and station prices due to the passage and signing by the Governor of an emergency bill increasing the state tax 1 cent. Most of the major distributors put the new prices out at their stations on April 18, the day following the signing of the bill which took effect immediately.

The week closed with the price for U. S. Motor gasoline held firmly at 7½ cents with an upward tendency. A little material was available at 7⅜ cents, usually from Texas points, but the tendency now is for the West Texas refiners to ask the full price based on Group 3 freights.

Both West Texas and other Mid-Continent refiners, while admitting that their stocks were a little larger, stated that they were in good shape and were not seeking business in advance of immediate shipments. Some were selling for the week only while others allowed 10 days from date of order for the completion of the purchase. For a slightly longer period, say 15 days, many were asking an eighth of a cent higher price.

Kerosene Inactive

Kerosene was inactive last week and towards the close prices were lower. Some of the refiners reduced their quotation one-eighth of a cent and the actual market range for 41-43 water white kerosene was 6½ to 6⅝ cents to spot buyers although several refiners were still holding for the 6¾ cents price. Jobbers state that they will not be in the market for further supplies. At present prices they say that the trade demands gasoline and for one thing they prefer to fill their tanks with gasoline rather than kerosene.

The furnace oil market was quiet and prices were easy but quoted as unchanged. Scattering cars were the sum total of the business done. The small demand may continue for a few weeks yet as the weather is still cool.

Gas oil continued only moderately active at the best. The larger users of U.G.I. oil are drawing on storage and staying out of the market. Their consumption is decreasing with warmer weather and longer days. Some business placed last week went at slightly less than 2½ cents, at least some oil firms who bid that price did not secure the orders and were told that their price was too high. For quantities that is the top of the market. Offerings were somewhat larger. One large order is stated to have been placed with a West Texas plant for 30-32 gas oil which met specifications except as to sulphur content. The buyer was a well-known broker and the price and final purchaser could not be learned.

Much of the straightrun gas oil will now be used for cracking and refiners say that it is worth more to them as cracking stock than the present market price. The demand for the zero gas oil was sluggish. Prices were a little lower, though not showing much change over the week.

Fuel Oil

In the fuel oil section there was a report that several of the large users of fuel oil in this district were seriously contemplating the installing of plants for the preparation and burning of pulverized coal. The Cudahy Packing Co. has such an installation at its Omaha plant where it is prepared to change from coal dust to oil at a moment's notice. The company is believed to contemplate further installations of this character and may begin at its Lyons plant shortly.

Other packing concerns as well as some other large users were stated to be favorably impressed with the results obtained from the use of pulverized coal as fuel. There was little demand last week for oil for heating purposes and the higher gravities which had been in demand for this use were lower in price, although there was some call for them as cracking stock. Even some of the cracking stills which use a prepared oil, usually gas oil, can run a good fuel oil in some cases as low as 24-26 gravity. Lower gravities have been run by such processes but only certain fuel oils are usable for this purpose.

Warmer Weather Released Stocks

The warmer weather has released for sale stocks of accumulated residual oil of a character which cannot be used during colder weather and this cuts into the market. West Texas heavy fuels were freely offered here last week and the prices named were below the recent quotations. The representative of one West Texas plant while stating that his lowest price was 45 cents, Group 3, to resellers, said that he understood that some of the refineries in that section had sold as low as 36 cents at the refinery which should be about 40½ cents, Group 3, or a little more, according to the location of the refinery.

The lubricating business was active, both motor oils and industrial specialties being in good demand. Prices are firm. Bright stocks continue to lead the way. Last week several refiners advanced their price for bright stocks 1 cent to 32 cents, Group 3. It is roughly estimated that the new Ford models alone will create a demand for 9,000,000 gallons of bright stocks and that the other makes of motors will all use more of the heavy oils.

Bright Stocks Soar

A year ago Mid-Continent bright stocks sold at 22 cents and Pennsylvania oils at a low of 26 cents. Today Mid-Continent bright stocks are selling at 32 cents and the Pennsylvania prices have about doubled. Steam refined stocks are also strong and neutrals show a little better tone.

There is little new in the tank wagon situation. There is less general cutting of prices than a year ago but there are some bad spots left. There is an active effort to line up dealers of all classes with contracts possibly to get them entered before the new code of ethics is made the law of the industry. The executive of one large company stated that the allowing of a 4-cent Q.D.A. in the Chicago district only had resulted in gradual weakening of the position of the major distributors throughout the territory and that there was a tendency to extend this discount beyond its original limits.

The expectation is that with the coming of the real gasoline season the situation will be so strong and material so closely held that the price cutter may find it hard to operate. It was also stated that several of last season's sources of supply would not be available to the bootlegger in 1928.

Tank Car Gasoline Market Stronger

Atlantic Coast Refiners Feel Worst Part of This Year Behind Them and More Optimistic Regarding Future

By A. E. Mockler
New York Bureau, The Oil and Gas Journal

NEW YORK, Apr. 22.—Stronger markets for tank car gasoline in the East are in sight, and the refining branch of the industry believes that the worst part of the year is now behind it. Lubricating oils have recorded further price increases, more or less sensational, and appear headed still higher. Kerosene is in firmer position and fuel oil is also showing strength this week.

U. S. Motor gasoline is still available in tank car lots at 9 cents per gallon at Atlantic Coast terminals, although a number of sellers are quoting a quarter cent over this figure. A number of the smaller companies, including Warner-Quinlan and Acewood, have been up to 9¼ cents for several days. Pan-American advanced to this figure a few days ago, and Shell Eastern Petroleum took similar action. Other large interests were expected to go up, but there appeared to be a general inclination to hold back until Standard Oil of New Jersey took the lead in a general upward movement. Up to the time of writing, however, the New Jersey company has not seen fit to revise its schedule, and is still quoting 9 cents. A mark up of a quarter to a half cent per gallon is considered only a matter of time, however.

A much better feeling is evident in the bunker fuel oil market, and the price basis is showing a greater degree of stability than for many months past. While there is nothing in the nature of a shortage of bunker "C" in this area, the statistical position of the market is working into firmer ground, and markets are well maintained on the part of the principal interests here.

Tank Car Gasoline

Following close to 10 days of almost continuous rainy, cold weather, there has been a marked change for the better over the week end, and with the sun once again in evidence, the usual pickup in automobiling has developed. Jobbers have been experiencing quite an active demand for gasoline for immediate delivery, and this in turn has been reflected by a sharp gain in buying in the tank car market. Some of the local companies, it is understood, are succeeding in getting some business at 9¼ cents per gallon. Others, who are quoting this figure, are still being compelled to do most of their business at the 9-cent level which the larger refiners are still maintaining.

Some talk of a general upward movement in gasoline prices is heard in trade circles, and should the eastern area be favored with more seasonable weather conditions, the trade is firmly of the belief that we will have a 10-cent market for U. S. Motor by the latter part of May.

A general strengthening in the position of the tank car market, without a corresponding markup in tank wagon prices, in the natural course of events, will tend to diminish buying of spot gasoline in the open market, and throw much of the business over on the marginal contracts which most of the distributors are carrying.

Tank Wagon Gasoline

Strong competition in up-state markets is still reported, and the price basis is somewhat disturbed. There is very little cutting in the metropolitan area, however, and the larger companies are all getting the same price for their products at retail. The independents continue to undersell the larger companies by about 2 cents per gallon, but the "big fellows" have not found it necessary to meet this competition.

Interest is centering in the premium gasoline situation. Several of the leading interests here are still getting a 3-cents-per-gallon advance on their high-test motor fuel, while other sellers are marketing so-called "premium gas" at no advance over the regular tank wagon quotation. There are numerous rumors afloat in the market regarding this or that new type of high-test antiknock gasoline which may make its appearance on the market during the summer season, and although it appears that some of these reports are well founded, there has been nothing official as yet from any of the large companies indicating that any change in the quality of their tank wagon delivery was being contemplated.

Large marketers are understood to be considering the question of a general increase of 1 cent per gallon in the tank wagon basis throughout the New York and New England territory, and early action along this line would not come as a surprise to the trade.

Lubs

Cylinder stocks have shown a sharp upward movement during the week, and reports in jobbing circles indicate that further increases are by no means improbable. Current offerings of Pennsylvania lubs for prompt shipment are far below the volume of inquiry reaching sellers, and the result has been a general upswing in market values. Advances averaging 4 cents per gallon for the week are reported.

Lubs in barrels, car lots, are quoted here this week as follows: 600 steam refined, 37 cents; 635 steam refined, 40 cents; 650 steam refined, 44 cents; 600 Pennsylvania flash, 47 cents; 630 Pennsylvania flash, 51 cents; 600 Warren "E," 40½ cents; 600 Oil City "E," 40 cents; bright stocks, light, 59 cents; bright stocks, dark, 57 cents.

Owing to the paucity of stocks of the more wanted grades, the market in many respects is little better than nominal as to price. Sellers report, however, that business had been done at the above prices, and report that further inquiry is reaching them at these levels.

Foreign buying has continued one of the outstanding features of the lub oil market. Considerable business has been booked this week, and the oil will start moving to export terminals within the next several days.

There were no changes noted this week with respect to the markets for red and pale oils. Small-lot trading continued to predominate, and prices were unchanged, although the market undertone has firmed up a little, in sympathy with the advances on cylinder stocks.

Fuel Oil

Developments in the industry's program of crude oil production curtailment are tending to exert a constructive influence upon the market for bunker "C" and East Coast refiners are viewing the outlook with a good deal more enthusiasm. The market basis continues unchanged at $1.05 per barrel, in bulk, at terminals, and $1.10 per barrel, barged alongside within the harbor limits, but some talk regarding possibilities of establishing a higher basis is heard.

Refiners in the East, it is pointed out, have made material progress in cutting down their production of fuel oil, due to the more general utilization of cracking equipment, and it is expected that further progress in this direction will be made during the balance of the year.

Demand for Bunker "C" from steamship interests continue the outstanding feature of the market. Contract withdrawals are well maintained and some spot buying is also in evidence. It is reported that spot buyers are finding it practically impossible to secure stocks in any quantity under the $1.05 level.

Kerosene

Improved inquiry for water white in the tank car market has strengthened the spot position somewhat. Standard Oil Co. of New Jersey, the leading seller, is again quoting the market at 8½ cents per gallon, f.o.b. Bayonne refineries, although other sellers continue to offer at 8 cents. In view of the improving market position, however, it would not be surprising to see the general quotation move up to 8¼ cents shortly. Export inquiry for kerosene has been lagging somewhat during the past fortnight, but buying by the domestic trade has shown quite a spurt, and stocks held by East Coast refiners have been moving readily into consuming channels.

Tank wagon kerosene sales have also picked up appreciably this week, and the market is well maintained at 15 cents per gallon in New York territory.

Petrolatum

Conditions in this division of the market have undergone no important modification during the week. Prices remain unchanged on all grades, and business continues confined within routine channels. Domestic buyers are operating on the white grades in a fair way, but are showing no disposition to anticipate requirements. Export trading is still continued to a great extent on the cheaper grades. Refiners show continued firm views as to price, and report that the market is rather well sold up.

Paraffin Wax

Continued softness rules in this branch of the market, and trading is still rather slow. Spot 120-122 a.m.p. is an eighth lower this week at 4⅜ cents per pound, with 133-135 a.m.p. showing a similar decline to 6½ cents and 135-137 a.m.p. off an eighth at 6¾ cents per pound. White crude scale is lower, with 122-124 a.m.p. reported sold at 3.60 cents per pound, off 15 points for the week.

Diesel Oil

Steadily increasing demand for Diesel oil for marine consumption is in evidence in East Coast markets.

Leading sellers continue to hold Diesel oil at $2 per barrel, in bulk, at principal East Coast loading terminals. Shell Eastern Petroleum Corp., however, is still holding the market at $2.10 per barrel. Business is holding up exceptionally well, refiners report.

Exports

Moderate inquiry for gasoline for shipment abroad is noted this week, but the volume of actual business has been disappointing. One cargo of 8,500 tons, made up of 2,000 tons of navy and 6,500 tons of 64-66, was reported booked out of Philadelphia for shipment to France, at Gulf prices plus 2s per ton for Philadelphia lading. Several additional inquiries for small lots were reported in the North Atlantic market during the week. Refiners are looking for an early pickup in gasoline buying for shipment to Great Britain and the Continent. Buying from these markets has been very much under normal for some weeks past. This situation is due in part to the unusually severe winter in Europe, which greatly curtailed motoring and left distributing companies with large stocks on hand. It is now thought, however, that marketers are pretty close to the end of their stored stocks, and that additional buying in United States markets may be reasonably looked for. Of course, the recent truce between the group of British companies and the Soviet naphtha trust, whereby larger quantities of Russian petrol will be marketed in Great Britain, will cut somewhat into the volume of sales of American gasoline in the British Isles, but notwithstanding this development, American refiners look for a substantial volume of British buying within the next two months.

Export inquiry for kerosene has continued rather sluggish this week. Cased stocks are moving in a fair way, with refiners quoting only on specific inquiry. Demand for bulk kerosene, however, has been of but limited proportions, and has been made up principally of small quantities.

Sales of lub oils for shipment abroad continued heavy, as reported in a preceding paragraph.

Paraffin wax has sold in slightly better volume for export this week. South America has been in the market for supplies in moderate volume, and some business is also reported with Germany. Far East inquiry was also fairly well sustained during the week.

Fuel oil sales in export channels are light this week. Prices on spot fuel oils have stiffened appreciably, and there is little or no selling pressure in evidence in East Coast markets.

Export business in the minor refined products has run along quiet, routine lines throughout the week.

Petroleum Exports

The following table shows principal exports of petroleum and refined petroleum products from New York during the past three weeks (all figures in gallons unless otherwise noted):

	Week ended		
	Apr. 13	Apr. 6	Mar. 30
Gasoline	60,000	854,906	513,700
Naphtha	357,600	1,833,200	1,125,900
Kerosene	20,000	1,253,400	695,400
Fuel oil	166,300	126,900	261,000
Lub oil	1,555,800	974,700	2,796,100
Pet. ref.	647,900	2,396,500	2,162,400
	Pounds		
Petrolatum			
Paraffin wax	745,300	1,498,200	1,007,800
Refined			
Scale	776,200	335,000	882,600
Lub grease	1,329,800	651,800	817,800

Imports

Imports of crude and refined oils at the principal United States ports for the week ended April 13 totaled 2,207,000 bbls., a daily average of 315,286 bbls., compared with 1,901,000 bbls., a daily average of 271,571 bbls. for the week ended April 6 and a daily average of 304,893 bbls. for the four weeks ended April 13. Details follow:

(Barrels of 42 gallons)

	Bbls.
At Atlantic Coast ports—	
Baltimore	75,000
New York	885,000
Philadelphia	461,000
Others	380,000
Total	1,801,000
Daily average	257,286
At Gulf Coast ports—	
New Orleans and Baton Rouge	361,000
Tampa	45,000
Total	406,000
Daily average	58,000
At all United States ports—	
Total	2,207,000
Daily average	315,286
Daily average 4 weeks	304,893

Included in the week's receipts at New York were the following shipments:

To Standard Oil Co. of New Jersey, 115,000 bbls. on the Canadolite from Mamomal.

To Gulf Refining Co., 75,000 bbls. on the Paulsboro from Las Piedras; 110,000 bbls. on the San Florentino from Las Piedras; and 25,000 bbls. on the Sucre from Las Piedras.

To Tide Water Oil Co., 95,000 bbls. on the Axtell J. Byles from Las Piedras.

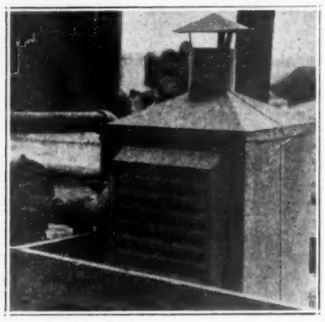
(Continued on Page 137)

Practical Suggestions in Refining

By W. T. Ziegenhain

PROTECT MOTOR FOR USE OUTDOORS AT LOW COST

At times it is necessary to install an electric motor in the refinery yard without any ready means of protection for the motor. An economical and satisfactory protection has been worked out by the Pecos Valley Refining Co. at Big Spring, Tex. A picture of the galvanized iron protector used in the plant is shown here. Ample ventilation for the cooling



of the motor is provided for as all sides are open and a covered vent in the top gives additional circulation. The motor being housed here operates a small centrifugal pump and it was most convenient to place it here in order to provide a flooded suction.

Improvised, yet effective coverings are also made from ordinary steel oil drums. In most cases the drum is slit open all of the way on one side, and, at right angles to the slit another slit is made across the face of the ends of the barrel, causing half of each end of the drum to fall out. By bending the free sides flat, the drum takes the shape of a half cylinder supported along the sides with perpendicular walls. This may be slipped over any small piece of machinery for protection and the walls may be cut down or bent in any manner to make the balance of the covering fit.

INCREASE AWARDS FOR REFINERY SUGGESTIONS

R. D. Rogers, general superintendent of the Tide Water Oil Co. refinery at Bayonne, has announced changes in the practical suggestion system, whereby rewards will be increased and explains as follows:

"The past year has shown an increased interest among the refinery employes in the operation of the refinery suggestion plan. A total of 375 suggestions were submitted and 160 awards were made. A number of good ideas suggested indicated considerable originality and ingenuity on the part of some of our employes. In an effort to increase the number of higher grade ideas presented, the following changes will be made in our present plan, retroactive to January 1, 1929.

1. Nature of suggestion:

"Suggestions are particularly desired on the following subjects:

Class 1. Improvements in manufacturing methods.

Class 2. Improvement in products.

Class 3. Reduction in costs.

Class 4. Elimination of waste.

Class 5. Elimination of fire and accident hazards.

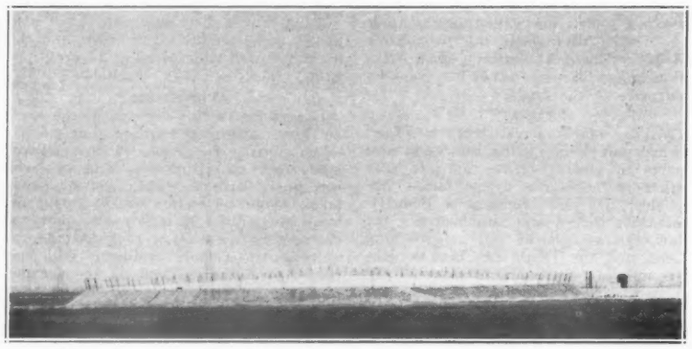
"It should be pointed out that suggestions which are considered as part of the regular duties of employes should not be taken up through the medium of the suggestion system, but should be reported

(Continued on Page 137)

USE NONCOMBUSTIBLE GASES TO PROTECT LARGE OIL RESERVOIRS

Using stack gases containing a high percentage of carbon dioxide to mix with the hydrocarbon vapors filling the space between the liquid and the tank roof has become a general practice where the Shell Petroleum Corp. has large volumes of oil stored under one roof. By thus reducing the concentration of oxygen in the tank vapors the possibility of an explosion or fire in case the tank is struck by lightning is remote. This method of protection is being applied in the Shell Oil Co.'s refinery at Martinez, Calif., and a discussion of the limits of the oxygen concentration as determined by experiments will be found elsewhere in this issue.

The large earthen reservoir shown in the accompanying picture holds 1,200,000 bbls. of West Texas crude and is located on the Shell company's tank farm near McCamey, Tex. The plant shown in the other picture is located near the reservoir and supplies the oxygen-free gases to the tank. The plant simply consists of a closed retort in which the oil fuel is burned and the gases of combustion are collected, washed, cooled and pumped to the reservoir.



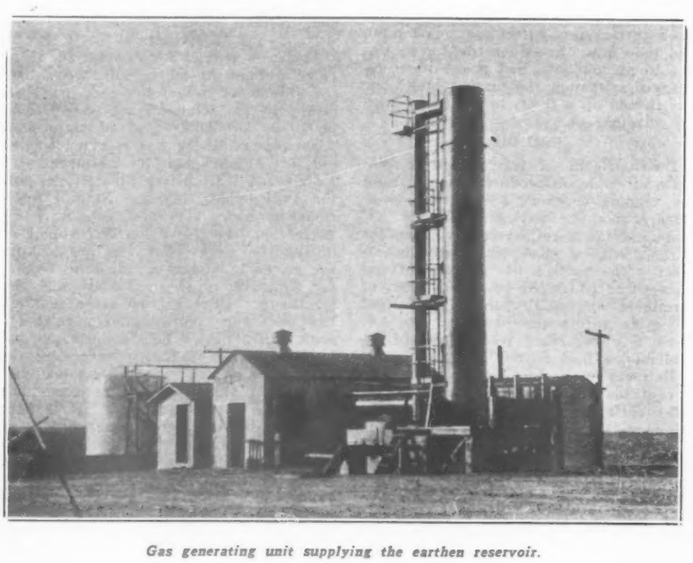
Earthen reservoir protected from fire by noncombustible flue gases supplied by burning oil in a closed retort. The installation is the property of the Shell Petroleum Corp. and located near McCamey, Tex. Note also the wire netting and towers to lead lightning charge away.

In this case, crude oil is used as the fuel because of the convenience and economy in using the oil stored in the tank rather than transporting some other fuel into the plant. From 6 to 8 bbls. of crude are burned daily in this retort in supplying the volume of noncombustible gases needed to dilute the oxygen and hydrocarbon vapors below the point where they are explosive. The retort is made of ordinary brick and lined with fire brick. It is constructed to be as nearly air tight as practicable so the amount of the air inlet may be controlled at the burner. The fuel is burned at one end and the hot gases are collected at the other end and pass up through a large scrubbing tower. A cold sodium carbonate solution is continuously sprayed into the tower and falls counter current to the gas flow washing out any traces of sulphur dioxide and free carbon. At the same time the gases are cooled to near atmospheric temperature, all of the heat of combustion being absorbed by the water. In turn, this water is cooled by the atmosphere in an ordinary open type cooling tower and is recirculated through the system.

The cooled gases are drawn through the top of the tower into a centrifugal blower and then forced into the line, supplying the reservoir. Control of the amount of air entering the fire box is most important and tests are made often to check the CO_2 content of these gases. Any excess of air will of course tend to defeat the purpose of the operation. The analysis of these gases passing from the retort will show approximately 12 to 14 per cent carbon dioxide, a trace of carbon monoxide, 3 to 4 per cent oxygen and the balance is nitrogen and inert gases. A sufficiently high temperature is maintained in the fire box and the supply of air adequate to allow all of the oil to be burned so there is no trace of hydrocarbon vapors in the gases.

The theoretical maximum of CO_2 in the gases approximates 15 per cent and the required air needed per gallon of oil burned is between 1,350 and 1,400 cubic feet at 60 degrees Fahrenheit. The gas produced in practice shows a slight volume loss and the volume of gases available per gallon of fuel burned is between 1,275 and 1,325 feet, measured at 60 degrees temperature. Another means of judging the ratio of air needed may be gained from the fact 14 pounds of air is required per pound of oil.

As a check on the efficiency of the operation samples of the breather gas off the tank are tested periodically and an electric spark or a flame is brought in contact. The absence of an explosion shows the concentration of the oxygen and hydrocarbon vapors is satisfactory for safety.



Gas generating unit supplying the earthen reservoir.

Recent Patents

ADDS GREEN FLUORESCENCE

1,708,592. Process of Purifying and Adding a Green Fluorescence to Lubricating Oil. Wirt D. Rial, Watson, and Whitford R. Barratt, Palos Verdes Estates, Calif., assignors to Pan American Petroleum Co., Los Angeles, Calif., a corporation of California. Filed June 7, 1927. Serial No. 197,225. Four claims. (Cl. 196—41.)

1. A process of purifying and improving the quality of lubricating oil containing acid constituents, comprising commingling the lubricating oil with calcium hydroxide and a coal tar pitch containing green fluorescent bodies at a temperature of substantially not less than 230 degrees Fahrenheit in quantities sufficient to neutralize and adsodb the acid constituents contained therein and add green fluorescent bodies to the lubricating oil and then separating the lubricating oil containing the green fluorescent bodies from the coal tar pitch residue, and excess calcium hydroxide containing the absorbed constituents.

HEAT WITH SULPHUR VAPORS

1,708,303. Process of Cracking Petroleum Hydrocarbons. Charles Raymond Downs, New Haven, Conn., assignor to Weiss & Downs, Inc., New York, N. Y., a corporation of New York. Filed December 1, 1925. Serial No. 72,422. Three claims. (Cl. 196—119.)

1. In cracking petroleum products, the step which comprises heating them by means of the vapors of boiling sulphur out of direct contact therewith but in heat transferring relation thereto and regulating the temperature of the said sulphur vapors by the pressure applied thereto.

RECOVER WAX WITH BUTANOL AND ACETONE

1,706,120. Removal of Wax from Hydrocarbon Oils. Robert S. Lane, Wood River, Ill., assignor to Standard Oil Co., Whiting, Ind., a corporation of Indiana. Filed January 2, 1926. Serial No. 79,004. Five claims. (Cl. 196—17.)

1. The method of removing petrolatum from oil comprising the admixture of the oil with a diluent containing butanol and acetone, cooling the mixture and separating the wax from the diluent oil.

CONSIDER COSTS WHEN INSTALLING AUXILIARY

(Continued from Page 130)

choice, which cannot be reduced to dollars and cents and so much that varies with our ever changing conditions that it is impossible to generalize and definitely say that any one type is the most economical. The data and assumptions on which the comparison of the types of drivers above mentioned is based are taken as far as possible from actual installations and operating records, and an attempt has been made to make the figures constitute an average. There are undoubtedly some plants operating with greater economy than here indicated, but it is not always possible to maintain the conditions that give the auxiliary equipment its greatest economy.

The costs in the table are for one brake horsepower for one month delivered by the power part of the pumping units, and are based on the following premises:

The units on which the costs are based are of a size that would deliver about 60 B.H.P.

Operating labor has been omitted because it would probably be about equal for all types.

Gas fuel has been taken as costing 8 cents per 1,000 cubic feet.

Electric current at 1 cent per kilowatt hour.

Lubricating oil is taken as costing 30 cents per gallon; steam cylinder oil at 40 cents per gallon.

Water is taken as costing one-half cent per barrel.

Interest on investment is taken as 6 per cent annually on complete installation cost.

Depreciation is based on a life of 15 years or 6⅔ per cent annually. This might better be called an obsolescence figure since our repair costs are considered as maintaining the unit in first class shape.

Installation Costs

The installation costs for the direct acting steam pumps and turbines include the necessary boiler plant, piping, foundations, housing, etc. For the electric motor driven pumps it includes foundation, housing, necessary switches and wiring but does not include the transformers or pole line to property. For the gas engine unit it includes foundations, piping, necessary cooling system, air starting system, etc.

The fuel costs are based on the steam consumption shown, with the boiler plant considered as using 1,500,000 cubic feet gas for every 1,000 pounds of steam generated. The costs for the steam units are based on no utilization of the exhaust steam.

In order to arrive at a cost figure for steam units when exhaust steam is used in the strippers, several typical plants were checked over to determine the average ratio of steam required in strippers for efficient stripping, to the amount of oil circulated. Around 160 pounds of steam per 1,000 gallons oil circulated should be sufficient.

Also the ratio of operating auxiliary B.H.P. to oil circulation was averaged and found to run around .22 B.H.P. for every 1,000 gallons of oil circulated per day. Using these figures we see that an absorption plant with an oil circulation of 4,500 gallons per day would require total auxiliary equipment developing 1 B.H.P. per hour., and would require the use of 720 pounds of steam per day in the strippers for denuding this amount of oil. This amounts to 30 pounds of steam per hour/per B.H.P. of auxiliaries that can be economically utilized from the exhaust.

The increased steam consumption of direct acting pumps and even steam turbines per B.H.P. hour is generally more than this amount when steam pressures of around 125 pounds gauge and back pressures of 30 pounds gauge are used. Therefore under these conditions it would be uneconomical to operate the total auxiliary installation with a back pressure on exhaust so that the steam might be used for distillation. Steam economy would be noted, however, by utilizing the exhaust from enough of the pumps to meet stripper requirements.

		Reciprocating steam pump assumed steam consumption 112 lb./H.P. hr.	Steam turbine assumed steam consumption 50 lb./B.H.P. hr.	Elect. motor assumed as 90% eff.	Gas engine 80% load factor assumed fuel consumption 14 cu. ft. per B.H.P. hr.
Installation cost per B.H.P.		$150.00	$138.00	$50.00	$170.00
Fuel	Gas @ 8c per M.	9.50	3.90	....	.85
	Elect. @ 1c per K.W. hr.	.....	.....	6.00	.....
Lub. oil @ 30c gal.		.....	.02	.02	.30
Steam cyl. oil @ 40c gal.		.10	.....	....	.....
Water @ one-half cent per bbl.		1.13	.46	....	.10
Interest @ 6%		.75	.69	.25	.85
Repairs and supplies		1.00	.75	.10	1.00
Depr. on basis of 15 yrs. life		.83	.77	.27	.94
Total oper. cost per B.H.P. per month		13.31	6.59	6.64	4.04

With larger units, say 150 to 200 B. H.P. and steam pressure of 200 pounds or more, marked economics are possible with turbine drive.

From this comparison the following more or less general conclusions may be drawn. The gas engine drive is desirable in permanent, long-lived installations because of its low operating cost. It is desirable where gas is valuable because of its low fuel consumption. It probably requires a better trained and more experienced operating organization than the other types if its greatest economy is to be realized.

The steam turbine drive is desirable if fuel cost is low. It is desirable in large installations using high steam pressures, for the economy is much greater under these conditions. It is desirable if the use of exhaust steam is economical and desirable.

The electric motor drive is desirable for temporary or uncertain installations, for its low first cost and high salvage value will offset its relatively high operating cost. If gas is very valuable the electric motor can often equal the other types in operating cost. The reliability of the power service must be considered.

Direct acting steam pumps are desirable if fuel cost is negligible and desired capacities are uncertain. Their simplicity, reliability and capacity range make them appreciated if conditions are unsettled and if the operating organization is inexperienced.

Combinations of types is desirable in many cases and will show good overall economies. For instance the use of gas engine or turbine driven units to take care of the known permanent and long-lived capacity with electric motor or steam pumps to handle the excess loads to take care of the peak or flush periods. Or the use of gas engine units for the steady loads and turbine or steam pumps for the varying loads.

In conclusion it must again be said that it is practically impossible to make any general statements as to the correct auxiliary installation. This discussion may indicate, however, some of the points to be considered when planning such installations.

INCREASE AWARDS FOR REFINERY SUGGESTIONS

(Continued from Page 136)

immediately by the individual superior. This includes irregularities in operations, equipment needing repairs, and all such general matters of routine operation.

2. Awards:

"In order to encourage the conception and submittal of new and original ideas, it has been decided to raise the top limit for an individual award from $25 to $100.

"The present method of making three final awards of $100 each for the three best suggestions received during the year will be modified as follows:

"A central suggestion committee has been organized in New York. This committee will receive, shortly after the end of each year, the 10 best suggestions from the local suggestion committee. The central suggestion committee will pick from these 10 the three suggestions having the greatest merit. They will make a minimum award of $100 for each of these three best suggestions. Should the central suggestions committee feel that any of these three suggestions deserve a larger award, they will increase the award, which, however, will not exceed a maximum of $500. These three major awards will not be made until the fourth or fifth month of the year immediately following the one in which the suggestions were submitted, in order to determine the relative merit of the good suggestions received during the last quarter of the year. This reservation is made in fairness to the men who submit their suggestions during this period.

TO CUT CALIFORNIA OIL 145,156 BARRELS

(Continued from Page 44)

wells during the course of the next 90 days, and since these projects will be permitted to flow unhampered for 10 days following completion in order to determine their individual ratability, this flush will be in excess of the established field production. The application of mutual proration will limit field production and prevent the attainment of any high peak, as the anticipated readjustment of production on the first and sixteenth of each succeeding month will arbitrarily reduce existing production to the projected maximum. Tentative plans contemplated the initiation of conservation measures early this week but action was held in abeyance due to an unavoidable delay and the first cut will become effective at 7 a. m., April 22. Preliminary instructions were completed late last week but the vast amount of detail peculiar to each field prevented the consummation of final plans. As a consequence of the delay encountered production will not reflect the maximum curtailment until late next week, as it will take operators several days to completely readjust their production activities to conform with the new schedule.

Summary of Schedule

A summary of the tabulation on potential and allowed production attached to the general order of the umpire follows, by fields:

District—	Percentage	Potential	Allowed
West Coyote	50	10,553	9,481
Dominguez	97.66	16,004	9,770
Elwood-Goleta	74.35	26,900	20,000
Fullerton-Brea-Olinda-East Coyote	91.10	15,165	13,814
Huntington Beach	88.75	47,610	42,259
Inglewood	90.86	25,843	23,480
Lawndale	100	714	714
Long Beach (proper)	70.94	188,874	133,982
Alamitos Heights Addition	70.94	8,912	6,327
Salt Lake	100	1,189	1,189
Montebello	97.25	10,832	10,525
Newport Beach	100	46	46
Potrero	58.97	909	537
Richfield	91.27	17,194	15,679
Rincon	82.05	3,577	2,934
Rosecrans	100	5,513	5,513
Santa Fe Springs: (Meyer & Zones above)	90		
(Nordstrom & Zones below)	77.7776	156,669	125,000
Santa Maria	98.50	4,728	4,658
Seal Beach	67.76	48,702	33,004
Summerland	82.58	122	109
Torrance	90.70	15,105	13,700
Ventura Avenue	90.87	56,217	51,084
Ventura County-Newhall	93.98	5,367	5,034
Watsonville	90.00	60	54
Whittier	85.65	1,658	1,420

TANK CAR GASOLINE MARKET IS STRONGER

(Continued from Page 135)

To Warner-Quinlan Co., 77,500 bbls. on the Agwiworld from Aruba.

To Asiatic Petroleum Co., 48,000 bbls. on the Lampas from Curacao, and 78,000 bbls. on the Swiftflight from Curacao.

To Mexican Petroleum Corp., 70,000 bbls. on the Frederick Ewing from Aruba.

To Shell Eastern Petroleum Products, Inc., 25,000 bbls. on the Scottish Bordered from Curacao; 80,000 bbls. on the Spondius from Curacao.

California Oil Receipts

Receipts of California crude and refined oils at Atlantic and Gulf Coast ports for the week ended April 13 totaled 247,000 bbls., a daily average of 35,286 bbls., against 525,000 bbls., a daily average of 75,000 bbls. for the week ended April 6 and a daily average of 82,179 bbls. for the four weeks ended April 13. Details follow:

(Barrels of 42 gallons)

At Atlantic Coast ports—	Bbls.
Baltimore	75,000
New York	172,000
Total	247,000
Daily average	35,286
Daily average 4 weeks	82,179

There were no receipts at Gulf Coast ports during the week.

Distribution of total California oil receipts is as follows:

	Bbls.
Crude	75,000
Gasoline	172,000

California gasoline is coming in for a better demand in the East Coast markets, and it is expected that movement will show material expansion as soon as the tank car basis here strengthens further. This year, judging from indications, very little of this California gasoline will come East for disposal in the open market, the great bulk of the movement being for the account of the large companies with established wholesale and retail outlets in the East.

Shell Eastern Petroleum Products is expected to bring considerable quantities of Shell gasoline eastward from California when the motoring season gets under way, and it is expected that Richfield will also be a heavy shipper of California U. S. Motor gasoline to the East this summer.

European inquiry for California gasoline has picked up notably in recent weeks, and this buying is tending to buoy the market on the Pacific Coast and make the market for that gasoline less attractive, from a price standpoint, to the eastern trade.

FUEL OILS STIFFENING IN COASTAL MARKETS

HOUSTON, Tex., Apr. 23.—Further stiffening of fuel oils featured Gulf Coast refinery markets the past week. Neutral oils continued a little unsettled with some distress material offered spasmodically although there has been no general lowering of prices during the past two weeks. Fuel oils are extremely tight and what material was available Tuesday was being held at a minimum of 75 to 80 cents in cargo lots.

Few sources have bunker oil even at that figure, and marketers are of the opinion that the increasing demand for cracking stock will cause refineries to cut deeper into their crude for gas oil at the expense of fuel oil, which may result in additional tightening of the latter product. Gas oils for cracking stock continued strong, but little of that product is on the open market, the majority of refiners having established outlets or using the product themselves.

AID TO STABILIZATION

NEW YORK, Apr. 20.—Frances E. Powell, chairman of the board of Anglo-American Oil Co., sailing from New York for England, said:

"The recent plan brought forth by American Petroleum Institute is a big step toward conservation and proper regulation of oil by leading petroleum companies of the world. This initial step should lead further and will ultimately prove of untold benefit to the petroleum industry. Certainly it will have a vast effect upon stabilization of crude oil production and considerably aid the industry in re-establishing itself on a sound and profitable basis."

Brief Items for Petroleum Refiners

To Present Fifteen Papers at Meeting Of Chemical Society

Fifteen papers dealing with developments in chemistry of special interest to the petroleum industry will be presented at the meetings of the petroleum division of the American Chemical Society to be held in Columbus, Ohio, April 30 and May 1. The meetings of the petroleum division are held in conjunction with the annual meeting of the society whose sessions will extend through May 3.

The meetings of the petroleum division will be held in Room 421 of the chemistry buildings of Ohio State University. J. Bennett Hill of the Atlantic Refining Co., Philadelphia, is chairman of the division, and Carl L. Johnson, secretary.

Following is the program for the two-day meetings:

Tuesday, April 30

2 p. m.—E. D. Ries: "The Relation Between Physical Characteristics and Lubricating Values of Petroleum Oils."

2:30 p. m.—S. W. Ferris, H. C. Cowles, Jr., and L. M. Henderson: "The Composition of Paraffin Wax."

3 p. m.—S. C. Lind and George Glockler: "Chemical Effect of Electrical Discharge on Gaseous Hydrocarbons."

3:30 p. m.—B. T. Brooks: "The Polymerization of Unsaturated Hydrocarbons."

4 p. m.—H. C. Allen: "Analyses of Some Natural Gases Before and After Treatment."

Wednesday, May 1

9:30 a. m.—Wallace J. Murray: "A Study of the Compression of Refinery and Casinghead Gases."

10 a. m.—R. C. Griffin: "The Determination of Sulphur in Petroleum Oils."

10:15 a. m.—A. E. Wood and William Mattox: "A Modification of the Lamp Method for the Determination of Total Sulphur in Petroleum Distillates."

10:30 a. m.—George G. Brown and Emory M. Skinner: "Motor Fuel Volatility."

11 a. m.—L. B. Hitchcock: "Gasoline Volatility Surveyed by Distillation Data."

11:30 a. m.—L. M. Henderson, S. W. Farris and J. M. McIlvain: "Specific Heats of Mineral Oils."

2 p. m.—W. H. Bahlke and W. B. Kay: "Specific Heats of Petroleum Vapors."

2:30 p. m.—H. R. Berry, Edison H. Smith and F. R. Lang: "Determination of the Specific Gravity of Asphalt by Means of a Hydrometer."

2:45 p. m.—J. Morrell and W. F. Faragher: "Cracking of Tar From Cannel Coal."

3 p. m.—W. F. Faragher and J. Morrell: "Cracking of Gas Tar."

APPOINT FOSTER HEAD OF PHILLIPS TANK CAR SALES

M. E. Foster, for several years assistant sales manager of the Phillips Petroleum Co., Bartlesville, Okla., has been appointed manager of tank car sales. Mr. Foster will have direct charge of tank car sales for both refinery and natural gasoline departments.

R. C. Jopling has been appointed manager of the retail marketing department. Mr. Jopling has been connected with the Phillips organization from the time the company entered the retail field about three years ago. Previously he was connected with the Waite Phillips Co. and later operated as an independent jobber.

L. R. Shanklin was appointed assistant to Mr. Jopling. Announcement of appointments was made by H. A. Trower, general sales manager of the Phillips company.

TIDAL REFINING COMPANY TO BUILD LARGE PLANT ON HOUSTON CHANNEL

HOUSTON, Tex., Apr. 23.—Plans of the Tidal Refining Co. of Tulsa for the construction of a refinery on the Houston ship channel became known at Houston this afternoon following a visit of C. R. Barton of Tulsa, manager of the refining department, to this city to complete the purchase of the site. The Tidal Refining Co. Tuesday was assigned an option taken by F. M. Hutchinson, Houston oil and real estate man, several months ago on the 700-acre Postel tract at Deerpark, 15 miles east of Houston on the ship channel.

While the detailed plans have not been determined, the site will be used for the construction of a refinery and oil terminal, according to Mr. Barton. The first unit of the refinery, which will have an initial capacity of 15,000 bbls. a day, will be completed and in operation during 1930. Additional units will be constructed as needed.

The Tidal Refining Co. tract is immediately adjoining to the east along the channel the tract of the Shell Petroleum Corp., which company already has construction of a 35,000 bbl. refinery and an oil terminal well under way. The tract has a 4,500-foot frontage on the channel where adequate facilities for loading of tankers will be provided. The site cost on the basis of $650 an acre and Mr. Barton stated the company had plans of expending roundly $3,000,000 on refinery and terminal facilities.

The Tidal plant will be operated principally on West Texas crude. So far no plans have been made for a pipe line from West Texas to Houston. For the present the oil will be handled through lines of other companies. The Tidal interests at present have about 5,000 bbls. daily production in West Texas.

The Tidal Refining Co., which is a subsidiary of the Tidewater Oil Co., has two other plants, one at Drumright, Okla., operated by the Tidal Refining Co., and one at Burkburnett, operated by the Tidal Western Refining Co.

SHELL OFFICIALLY ENTERS NEW ENGLAND OIL MARKET

BOSTON, Mass., Apr. 22.—Shell Eastern Petroleum Products, Inc., officially entered the New England oil market today with a luncheon at the Hotel Statler and the ceremony of pumping first gasoline of the new company.

The Shell Eastern Petroleum Products, Inc., was organized as a subsidiary of the Shell Union Oil Co., a member of the Royal Dutch-Shell group, to enter the New England and North Atlantic states market, extending the facilities of the parent company to the entire country. The Shell Eastern Petroleum Products, Inc., will distribute Shell 400 Extra Dry gasoline and Super Shell gasoline from the filling stations of the New England Oil Co., whose property and assets were purchased by the new company.

Representatives of the governor of Massachusetts; the mayor of Boston; members of the New England Council and the Boston Chamber of Commerce and several officials of New England's largest industries attended the official luncheon welcoming the new company, which was held at the Hotel Statler today. A. F. Carter, a New England man and the president of the Shell Eastern Petroleum Products, Inc., speaking for his company, said:

"We believe that we have done something constructive for New England industry. The acquisition of the old New England Oil interests by Shell and the subsequent creation of the Shell Eastern Petroleum Products, Inc., marks the entrance of a new factor into New England business. It has been decided to continue the old organization, strengthening it as may be deemed advisable from time to time. Of course, the prestige of Shell back of the old interests gives them a permanency and gives them a dignity, which without such influence they probably would never acquire.

"As a result of these negotiations this enterprise has been preserved for New England and we believe that it is typical of the spirit of this section that enterprises of this and other natures shall be preserved for New England and not liquidated on a basis which reflects little credit for those responsible to the company. It, of course, goes without saying that the business will be expanded and that the company will be a much larger factor for employment of labor of all kinds in the future than it has been in the past."

TEXAS PETROLEUM CO. ACQUIRES WITHERSPOON

SAN ANTONIO, Tex., Apr. 22.—Texas Petroleum Products Co. of San Antonio and Schimmel Production Co. of Fort Worth have formed a merger with a capitalization of $2,500,000 and have purchased the producing properties of the Witherspoon Oil Co. in the Somerset Field, 18 miles southwest of San Antonio, amounting to about 200 bbls. of oil daily. Schimmel Production Co. had about 350 bbls. a day production in Somerset Field besides leases and property in west Texas and north Texas.

The merged companies take the name Texas Petroleum Co. with V. G. Schimmel as president, Grover Shaw, vice president, Glen Schimmel, second vice president, C. L. Meserole, secretary, W. I. Lighthouse, treasurer. Offices will be maintained in the Smith-Young Tower Building in San Antonio. In November, 1927, the Texas Petroleum Products Co. formed a merger with the Witherspoon Refinery in the Somerset Field and the new company now has the complete cycle of production pipe lines and refining, having acquired the Witherspoon pipe line system in the Somerset Field in the recent deal.

The Texas Petroleum Co. will market its product through independently owned filling stations and in addition to its distributing station on South Medina Street in San Antonio will build additional bulk stations over southwest Texas in order to supply the independent dealers. The company will continue to use the trade name "Sterling."

LAMONTE REFINERY TO OPERATE

CHICAGO, Apr. 20.—E. G. Lewis of the Lamont Refining Co., of Lamont, Ill., states that the owners plan to operate the refinery in the near future. Mr. Lewis denied the report that the refinery had been sold to Ohio oil men.

SINCLAIR BUYS MORE STATIONS

CHICAGO, Apr. 20.—The Sinclair Refining Co. has bought the stations of the Hoopeston (Ill.) Oil Co. The stations are the bulk plant at Hoopeston and a branch at Rossville.

APPOINT MILLER HEAD OF SHELL CORPORATION SALES

E. L. Miller, formerly connected with the Shell Co. of California, has been appointed vice president in charge of sales for the Shell Petroleum Corp. Mr. Miller succeeds G. G. Woodruff who recently resigned. He will have his headquarters at the St. Louis offices of the Shell corporation.

L. Van Eghen, formerly vice president of the New Orleans Refining Co., has been appointed assistant to the vice president in charge of southern sales. The properties of the New Orleans Refining Co. are in the process of being merged with the Shell corporation.

ILLINOIS TAX REFUND CASES

CHICAGO, Apr. 20.—The Illinois Supreme Court on April 15 heard arguments in an appeal of two gasoline tax refund cases which had been appealed by the State from a decision of the lower court which held that the money collected under the gasoline tax of 1927 must be refunded as the law was declared unconstitutional. The two cases were for small amounts. In another case the lower court held that the State should retain the money collected under the gasoline tax.

OHIO GASOLINE ADVANCED

CHICAGO, Apr. 20.—All the major distributors advanced the price of gasoline at the tank wagon and service stations 1 cent a gallon on April 18. This advance resulted from the passage of a measure increasing the tax from 2 to 3 cents a gallon which contained an emergency clause making the new tax effective as soon as the bill was signed. The governor affixed his signature on April 17 and the distributors advanced their prices on April 18.

IMPROVE PENNZOIL PLANTS

OIL CITY, Pa., Apr. 22.—The Pennzoil Co. has an extensive improvement program under way at the Rouseville refineries of the company. A pipe still with a capacity of 4,000 bbls. of crude oil daily is being constructed. This unit incorporates the latest principles in the design of pipe stills. The company also is building a 1,200-bbl. vacuum still for refining steam refined stocks.

Other improvements include four 325-plate, 48-inch filter presses. A 400-horsepower boiler is being added to the boiler plant.

ENLARGE MINATITLAN REFINERY

An extensive program of improvements is under way at Minatitlan by Mexican Eagle Oil Co. (Royal Dutch), and the company plans to concentrate on oil development operations in the State of Tabasco, where it has owned extensive leases for several years. In addition to enlarging its refinery at Minatitlan, the company has just awarded a contract for dredging a 26-mile channel 200 feet wide and 28 feet deep in the Coatzacoalcos River from its mouth at Puerto, Mexico, to the Minatitlan refinery.

NEW OIL COMPANY

CHICAGO, Apr. 20.—The Trojan Oil Co., has been incorporated for $25,000 to conduct an oil jobbing business with headquarters at 510 Poplar Street, Waukegan, Ill. The members of the organization are Frank Egger, E. Davis and H. C. Litchfield.

Technical Questions Answered

BY CHARLES K. FRANCIS, PH.D., TECHNICAL EDITOR

This department of The Oil and Gas Journal is devoted to the manufacturing branches of the oil industry. Those connected with the refining of crude petroleum, the manufacture of natural gasoline and closely allied industries are invited to submit their problems to Dr. C. K. Francis, technical editor. The department was created for the purpose of aiding managers, superintendents, engineers, chemists and all those engaged in the various phases of plant operation; also those connected with the marketing and utilization of petroleum products.

Questions should be submitted in as much detail as possible so as to assure a satisfactory answer.

All inquiries should be signed and if other than the given initials are to be used please indicate the desired letters.

Questions involving patented processes, intricate formulas and calculations and estimates of costs, for obvious reasons, cannot be answered. The replies will appear on this page within a reasonable time.

EXPLOSIVE CONDITION IN TANKS

What kind of lamp is used for testing a tank for explosive mixtures of petroleum gas and air? What other methods are used for this inspection?—L. E. C.

Lamps which follow the principle included in the Davy safety lamp may be used for detecting the presence of dangerous mixtures of hydrocarbon gases, or vapors, and air. A flame is burned in these lamps inside a chimney of wire gauze. When a burning safety lamp is placed in an atmosphere composed of combustible gases and air, the flame will become larger and continue to grow in size with increase in the quantity of dangerous gas or vapor. The flame does not extend beyond the screen because the temperature is lowered below the kindling point of the gas by conduction through the metal in the gauze. This kind of lamp has been improved so that means are provided for measuring the height of the flame and thus arrive at some estimate of the quantity of explosive gas present.

When this form of a lamp is to be used for the inspection of tanks, it should be burned outside of the tank for several minutes to be certain that the flame is properly adjusted. The inspector should wear a mask and not enter a tank in the absence of an assistant who is provided with means for rescue if required. The lamp is carried around the tank and likely places for gas pockets are especially tested. As a general rule a tank cannot be considered safe if there is an appreciable rise in the flame.

The United States Bureau of Mines has reported an investigation which reveals that while permissible miners' flame safety lamps when correctly assembled and intact will not ignite mixtures of gasoline vapor and air, these lamps are not suitable for determination of inflammable vapor content of the atmospheres in and around tanks. The lamps will give unmistakable evidence of the presence of an explosive mixture and will give satisfactory indications to a trained observer in vapor percentages of approximately half of the lower explosive limit. Below this limit the lamps decrease in value as detectors, and at 0.3 per cent, and lower the evidence is so small and difficult to observe that it should not be depended upon. Safe practice requires that repair men do not enter a tank if any trace of gas is present, and since the tests show that the flame in the safety lamp cannot be depended on to give evidence of gas percentages below about 0.3 per cent.

It appears that the safety lamp cannot be relied upon, except when used by an expert, to give absolute information about explosive conditions. Analyses of the gas, as taken from different parts of a tank are sometimes made. Actual tests with a flame or spark of small portions of this gas, such as may be made in a test tube, are considered very good and have the advantage in the time required over analyses.

MINERAL OILS ARE NOT FOODS

What is the reason that it is not legal to mix a high-grade lubricating oil with food preparation, such as salad dressing, and to sell this kind of a preparation? I am asking this because I have been told that the Food Inspection Department will not permit its sale—E. B. A.

The United States Department of Agriculture is in charge of the inspections for enforcing the Food and Drug Act, and what has been reported to you may be the recent decision that a mineral oil cannot be digested and assimilated, so cannot be called a food. It has neither food value nor condimental value; it therefore has no proper place in food products. Its use in foods, either as a substitute for edible oil in such products as mayonnaise, salad dressing, or household flavors, lowers the food value of the finished product. This is expressly prohibited by those provisions of the Federal Food and Drugs Act which define a food as adulterated if any substance has been mixed and packed with the article so as to reduce or lower or injuriously affect its quality or strength, or if any substance has been substituted wholly or in part for the article. Products containing mineral oil, intended for the cure, mitigation or prevention of disease, are drugs within the definition of that term set up by the act and should be plainly and conspicuously labeled as such. No unwarranted therapeutic claims should appear upon the labels or be made otherwise in connection with the sale of such products.

BURNER FUEL OILS

What is the difference in the quality of a burner fuel oil if purchased as fuel oil and when purchased as distillate? Should burner oil be purchased by weight with a specified heating value, similar to the basis used in some cases when purchasing coal?—R. K.

The oil that is used for heating in what are called domestic installations, is known in a general way by the term burner oil. Where there are no specifications mentioned, a large number of oils of considerable difference in properties, could be furnished under the simple requirement designated by fuel oil; because fuel oil includes the heavy residues, the gas oils and the distillates. Distillate is usually applied to the burner oils which are obtained from petroleum after the removal of the gasoline and naphtha fractions. The different oils of this character, as produced in the Mid-Continent district, and as sold by the refiner, may be classified by gravity, as follows:

Gravity 30 A.P.I. and under, fuel oil.
Gravity 30-36, gas oil.
Gravity 36-40, distillate.

It is the usual practice when purchasing these products to state the desired specifications. The specifications may include gravity, freedom from water and solid matter, flowpoint, flashpoint and in some cases color is mentioned. Color is not considered important except when a special product is desired, such as straw distillate.

Petroleum, and the various liquid products, are sold in the United States on a volume basis and if any other unit were specified there may be complications which would be reflected in the cost. While the volumes commonly used are in terms of barrels and gallons these may be easily converted to weight if desired, when the gravity is known. The same is true about heating value. The heating value of the oils which are used as burner oils is not so important as other properties; for the actual B.t.u. which may be possible to develop from them cannot vary more than a few hundred. Also: the B.t.u. of an oil may be calculated from the A.P.I. gravity with results closely approximating those derived from a calorimeter determination, at any rate close enough for all practical purposes.

DISTILLATION AND FRACTIONATING TOWERS

Can you tell me where to find information about distillation with bubble towers? I want to know something about the theories of distillation and the practical principles covering the separation of light oils.—R. O.

The subject of fractionation has been covered in numerous articles which have appeared in The Oil and Gas Journal. There are several books but two may be mentioned. Distillation Principles, by Sydney Young, published by Macmillan Company, and Elements of Fractional Distillation, by Robinson, published by McGraw-Hill Book Company. The address of these publishers is New York City.

An article Design Visible Distillation Apparatus, by R. H. Espach, which was printed in The Oil and Gas Journal, November 1, 1928, page 120, gave the details of a study of fractionation problems by the United States Bureau of Mines. Much of this work has appeared in Technical Paper 431 of the bureau, by Cooke and Rue.

The investigations by Cooke and Rue were based on the operation of a small bubble cap tower, the action on each tray of which could be observed through a sight glass set in the side of the tower. It appears, according to these authors, that the best separations are obtained at the top of the tower, where the mixtures to be separated are the simplest. It is also necessary to remove all residuum before attempting to fractionate the desired light products. This is accomplished in the bottom section of the tower and in the evaporator when the still is so equipped. If the residuum is to be entirely stripped of the desired light products it must be heated enough to vaporize some of the residuum itself. This fraction is knocked back in the bottom sections of the tower or, if desired, can be removed by a separate dephlegmator on the evaporator. The other preliminary separation is necessary only when a crude, high in light gasoline, is to be distilled. If such a crude enters the system through a heat exchanger, a considerable portion of its gasoline content will be vaporized and can be separated, condensed and run direct to storage if the heated crude is passed through a flash drum or evaporator. If precautions are taken to prevent evaporation and any condensed vapors are run to a gasoline recovery plant, all of the light gasoline fraction will be obtained in this fraction in a condition suitable for blending with the heavier fractions recovered later from the top of the combination tower. Separating the light gasoline in this way prevents the formation of excessive quantities of vapor when the crude is passed through the pipe still, and improves the effectiveness of the combination tower by simplifying the composition of the mixed vapor that enters it.

Technical Paper 431, Studies in the Fractional Distillation of Crude Petroleum, by Cooke and Rue, may be obtained for 15 cents from the Superintendent of Documents, Washington, D. C.

ODOR OF GASOLINE FROM HIGH SULPHUR CRUDE

The crude we are refining contains a large percentage of sulphur with some hydrogen sulphide. We treat with doctor but this does not help the odor of the gasoline and would appreciate any suggestions you may have on the subject.—P. G. W.

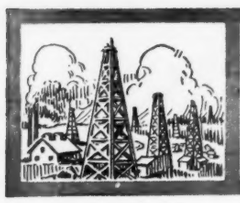
There are so many conditions to consider with respect to the sweetening of a gasoline that it is impossible for me to say what is the cause of the trouble. The subject of sulphur removal from gasolines was discussed by Dr. A. E. Dunstan at the Chicago meeting of the American Petroleum Institute last December and was reported in The Oil and Gas Journal, December 13, 1928, page 138. He outlined the recognized principles for the removal of sulphur compounds which are known to have much to do with the objectionable odors of some gasolines.

The malodorous sulphur bodies that appear in raw distillates are in all probability decomposition products derived from the sulphur compounds contained in the crude oil. When the normal crude is distilled under ordinary conditions a gasoline may be obtained which contains between 0.1 and 0.2 per cent sulphur. If this same crude is gently flocculated with a small quantity of acid, allowed to stand to precipitate the asphalt, and then distilled, the similar gasoline fraction will contain about 0.025 per cent sulphur with a reasonably sweet odor. Doctor Dunstan says, "In approaching the problem of sulphur content in gasoline we first of all determine what sort of chemical sulphur compounds there were in the gasoline, and leaving out hydrogen sulphide, we isolated a whole series of mercaptans and sulphides. Some disulphides were present and a trace, probably 0.01 per cent of what might be called cyclic sulphur compounds.

"In working out the refining scheme one naturally turns first of all to the removal of hydrogen sulphide. If you do not remove hydrogen sulphide at the earliest possible moment it will be oxidized to free sulphur and no reagent known will remove the free sulphur from the petroleum distillate. If you leave the free sulphur in the gasoline you are going to have trouble with corrosion all the way through.

"We get our alkali washing done at a very early point, either in the condenser or immediately after the condensation. The soda wash really serves two purposes; it removes hydrogen sulphide and to a certain extent mercaptans. If the mercaptans are left in they also tend to oxidize into disulphides."

The removal of the mercaptans may be difficult. The lower mercaptans are acted upon by caustic soda but some form of oxidation is required when the mercaptans of higher molecular weight are present. Chlorine may be effective in some cases, and this explains the use of the chlorine compounds when treating gasolines with small quantities of the mercaptans, but for complete removal as is required when the least trace of odor may be objectionable, the treating operation may have to include the application of acid.



REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

GASOLINE AND NAPHTHA

	Apr. 23		Apr. 16		Apr. 9	
OKLAHOMA (Group 3)—						
50-52 450 endpoint	.07⅛	.07¼	.07	.07¼	.07	.07¼
56-58 450 endpoint	.07⅛	.07¼	.07	.07¼	.07	.07¼
58-60 450 endpoint	.07¼	.07⅜	.07	.07¼	.07	.07¼
*58-60 437 endpoint (U. S. Motor)	.0752		.0741		.0738	
*60-62 437 endpoint	.075		.0771		.0775	
*60-62 400 endpoint	.0787		.0786		.0741	
*64-66 375 endpoint	.085		.0841		.0825	
68-70 360 endpoint	.08¼	.08½	.08¼	.08½	.08¼	.08½
64-66 437 endpoint (blend)	.07½	.07⅝	.07½	.07⅝	.07½	.07⅝
NORTH TEXAS—						
56-58 450 endpoint	.07	.07¼	.06¾	.07	.06¾	.07
58-60 450 endpoint	.07	.07¼	.06¾	.07	.06¾	.07
58-60 437 endpoint (U. S. Motor)	.07¼	.07⅜	.07¼	.07⅜	.07⅛	.07¼
60-62 400 endpoint	.07⅝		.07½	.07⅝	.07½	.07⅝
64-66 390 endpoint	.07¾		.07⅝	.07¾	.07⅝	.07¾
64-66 375 endpoint	.07¾	.08	.07¾	.08	.07¾	.08
68-70 360 endpoint	.08⅛	.08¼	.08⅛	.08¼	.08⅛	.08¼
64-66 437 endpoint (blend)	.07¼		.07¼		.07¼	
NORTH LOUISIANA—						
58-60 437 endpoint (U. S. Motor)	.07¾		.07¾	.08	.07½	.07¾
ARKANSAS—						
58-60 437 endpoint (U. S. Motor)	.07¾		.07¾	.08	.07½	.07¾
PENNSYLVANIA—						
52-54 Naphtha	.08¼	.08½	.08¼	.08½	.08¼	.08½
54-56 Naphtha	.08½	.08¾	.08½	.08¾	.08¼	.08½
58-60 Gasoline	.09¼	.09½	.09	.09¼	.08¾	.09
60 Gasoline	.09½	.09¾	.09¼	.09½	.09¼	.09½
62 Gasoline	.09¾	.10	.09¾	.10	.09¾	.10
64 Gasoline	.10¼	.10½	.10¼	.10½	.10¼	.10½
CALIFORNIA—						
58-60 437 endpoint (U. S. Motor) domestic	.09	.10	.09	.10	.09	.10
CHICAGO DISTRICT (Based on Group 3)—						
50-52 450 endpoint (Naphtha)	.07	.07⅛	.07	.07¼	.06¾	.07
56-58 450 endpoint	.07	.07¼	.07	.07¼	.06¾	.07
58-60 437 endpoint (U. S. Motor)	.07½		.07¾	.07½	.07¼	.07¾
60-62 400 endpoint	.07⅝	.08	.07⅝	.07¾	.07⅜	.07⅝
64-66 375 endpoint	.08¼	.08¾	.08¼	.08¾	.07¾	.08
68-70 360 endpoint	.08⅜	.08½	.08¼	.08¼	.08¼	.08½
64-66 437 endpoint (blend)	.07½	.07⅝	.07½	.07⅝	.07⅜	.07½
GULF COAST (Export)—						
58-60 (U. S. Motor)	.08½		.08½		.08½	
60-62 400 endpoint	.09½		.09½		.09½	
61-63 390 endpoint	.09¾		.09¾		.09¾	
64-66 375 endpoint	.10		.10		.10	

*Weighted average prices April 22, 15 and 8 as reported by representative refiners. Sales to jobbers only.

NATURAL GASOLINE

	Apr. 23		Apr. 16		Apr. 9	
OKLAHOMA (Group 3) —						
Grade A, 72-79.9, 375 e.p., rec. 90%	.07¼	.08	.08		.08	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.07⅞	.08	.08		.08	
Grade B, 76-83.9, 375 e.p., rec. 85%	.07⅝	.07¾	.07¾		.07¼	.07½
Grade BB, 84-92, 375 e.p., rec. 85%	.07⅝	.07¾	.07¾		.07¼	.07½
Grade C, 80-90, 375 e.p., rec. 78%	.07½		.07½		.07	.07¼
NORTH TEXAS—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.07⅞	.08	.08		.08	
Grade AA, 80-87.9, 375 e.p., rec. 90%	.07⅞	.08	.08		.08	
Grade B, 76-83.9, 375 e.p., rec. 85%	.07¾		.07¾		.07¼	.07½
Grade BB, 84.92, 375 e.p., rec. 85%	.07¾		.07¾		.07¼	
Grade C, 80-90, 375 e.p., rec. 78%	.07½		.07½		.07	
NORTH LOUISIANA—						
Grade AA, 80-87, 375 e.p., rec. 90%	.08¼		.08¼		.08¼	
Grade BB, 84.92, 375 e.p., rec 85%	.08		.08		.07¾	
Grade C, 80-92, 375 e.p., rec. 78%	.07¾		.07¾		.07½	
CALIFORNIA—						
75-78, 375-390 endpoint	.08	.09	.08	.09	.09	.10
CHICAGO DISTRICT (Based on Group 3)—						
Grade A, 72-79.9, 375 e.p., rec. 90%	.07⅞	.08	.08		.07¾	.08
Grade AA, 80-87.9, 375 e.p., rec. 90%	.07⅞	.08	.08		.07¾	.08
Grade B, 76-83.9, 375 e.p., rec. 85%	.07¾		.07¾		.07¼	.07½
Grade BB, 84-92, 375 e.p., rec. 85%	.07¾		.07¾		.07¼	
Grade C, 80-90, 375 e.p., rec. 78%	.07½		.07½		.07	

BURNING OIL

	Apr. 23		Apr. 16		Apr. 9	
OKLAHOMA (Group 3)—						
41-43 water white Kerosene	.06½	.06⅝	.06⅝	.06¾	.06⅝	.06¾
42-44 water white Kerosene	.06¾	.07	.07	.07¼	.07	.07¼
NORTH LOUISIANA—						
41-43 water white Kerosene	.07	.07¼	.07¼		.07¼	
NORTH TEXAS—						
41-43 water white Kerosene	.06⅛	.06¼	.06¾	.06½	.06½	.06⅝
40-42 water white Kerosene	.06		.06¼		.06¼	.06⅞
ARKANSAS—						
41-43 water white Kerosene	.07	.07¼	.07¼		.07¼	
PENNSYLVANIA—						
43 Kerosene prime white	.07¼	.07½	.07¼	.07½	.07	.07¼
45 Kerosene water white	.07¼	.07½	.07¼	.07½	.07¼	.07½
46 Kerosene water white	.07¾	.08	.07¾	.08	.07½	.07¾
47 Kerosene water white	.08¼	.08½	.08¼	.08½	.08¼	.08½
300 Mineral Seal	.07¾	.08	.07¾	.08	.07¾	.08
CALIFORNIA—						
38-40 water white Kero. (high-burning test)	.06½	.07	.06½	.07	.06½	.07
Engine distillate, 43-44, 445 endpoint	.07½	.08½	.07½	.08½	.07½	.08½
Engine distillate, 42-44, 480 endpoint	.07	.08	.07	.08	.07	.08
CHICAGO DISTRICT (Based on Group 3)—						
41-43 water white Kerosene	.06¼	.06½	.06½	.06¾	.06¾	
42-44 water white Kerosene	.06⅝	.06⅞	.07	.07⅛	.07⅛	.07¼
GULF COAST (Export)—						
41-43 prime white	.07¾		.07¾		.07¾	
41-43 prime white	.08¾		.08¾		.08¾	

FUEL OIL

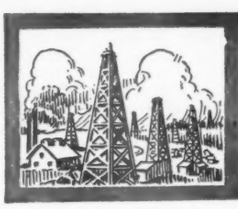
	Apr. 23		Apr. 16		Apr. 9	
OKLAHOMA (Group 3)—						
Below 18 Fuel Oil, per bbl.	.50	.55	.50	.55	.50	.55
18-22 Fuel Oil, per bbl.	.55	60	.55	.60	.55	.60
22-26 Fuel Oil, per bbl.	.60	.65	.60	.65	.60	.67½
24-26 Fuel Oil, per bbl.	.65	.70	.65	.70	.65	.70
26-30 Fuel Oil, per bbl.	.82½	.87½	.82½	.87½	.82½	.87½
28-30 Fuel Oil, per bbl. (industrial)	.90	.95	.90	.95	.90	.95
32-36 Gas Oil (industrial)	.02½	.02⅝	.02⅝	.02¾	.02¾	.03
32-36 Gas Oil (straw color)	.02¾	.03	.02¾	.03	.03	
36-38 Distillate	.03¼	.03½	.03½	.03¾	.03¾	.03⅞
38-40 Straw Distillate	.03½	.03¾	.03¾	.04	.03¾	.04
NORTH TEXAS—						
Below 20 Fuel Oil	.60	.65	.65	.70	.70	
24-26 Fuel Oil, per bbl.	.65	.70	.70	.72½	.72½	.75
32-36 Gas Oil (straw)	.02⅝	.02¾	.02¾	.03	.03	.03⅛
38-40 Straw Distillate	.03½	.03¾	.03¾	.04	.03⅞	.04
NORTH LOUISIANA—						
18-20 Fuel Oil, per bbl.	.70	.75	.70	.75	.70	.75
32-36 Gas Oil	.02¾		.02¾		.03	
ARKANSAS—						
33-36 Distillate	.03¼	.03½	.03¾	.03⅞	.03¾	.03⅞
32-36 Gas Oil (straw)	.02⅝	.02¾	.02¾		.03	.03¼
16-22 Refinery Fuel Oil, per bbl.	.70	.75	.70	.75	.70	.75
GULF COAST (South Texas)—						
Gas Oil	.03½	.04	.03½	.04	.03¼	.04
Bunker C Fuel (cargo lots), per bbl.	.75	.85	.72½	.75	.72½	.75
Bunker C Fuel (small lots)	.95	1.00	.95	1.00	.95	1.00
PENNSYLVANIA—						
30-34 Fuel Oil	.04¾	.05	.04¾	.05	.04	.04¼
36-40 Fuel Oil	.05¼	.05½	.05¼	.05½	.05	.05¼
CALIFORNIA—						
32-36 Distillate	.04¼	.04¾	.04¼	.04¾	.03¾	.04
26-32 Distillate	.03½	.04	.03½	.04	.03	.03½
15-20 Fuel Oil, Bunker (at tide water)	.65	.85	.65	.85	.65	.85
15-20 Fuel Oil (cargo lots), per bbl.	.70	.85	.70	.85	.70	.85
27 plus Diesel, per bbl.	.90	1.05	.90	1.05	.90	1.05
CHICAGO DISTRICT (Based on Group 3)—						
22-26 Fuel Oil, per bbl.	.60	.65	.60	.67½	.62½	.67½
18-22 Fuel Oil, per bbl.	.50	.55	.52½	.57½	.55	.60
28-30 Fuel Oil (zero)	.95	1.05	1.00	1.05	1.05	1.10
32-36 Gas Oil, zero	.02½	.02¾	.02½	.02¾	.02½	.02¾
32-36 Gas Oil (industrial)	.02½	.02⅝	.02½	.02⅝	.02½	.02⅝
36-38 Distillate	.03⅝	.03¾	.03⅝	.03¾	.03⅝	.03¾
38-40 Straw Distillate	.03¾	.04	.03¾	.04	.03¾	.04

LUBRICATING OIL AND WAX

	Apr. 23		Apr. 16		Apr. 9	
OKLAHOMA (Group 3)—						
100 vis., 2 color, 20-25 cold test	.06	.06½	.06	.06½	.06	.06½
100 vis., 3 color, 20-25 cold test	.05½	.05½	.05½	.05½	.05½	.05½
150 vis., 3 color, 20-25 cold test	.07¼	.07½	.07¼	.07½	.07¼	.07½
150 vis., 4 color, 20-25 cold test	.07	.07¼	.07	.07¼	.07	.07¼
180 vis., 3 color, 23-28 cold test	.08¾	.09	.08¾	.09	.08¾	.09
180 vis., 4 color, 23-28 cold test	.08¼	.08¾	.08¼	.08¾	.08¼	.08¾
180 vis., 5 color, 23-28 cold test	.08¼	.08½	.08¼	.08½	.08¼	.08½
200 vis., 3 color, 23-28 cold test	.09¼	.09½	.09¼	.09½	.09¼	.09½
200 vis., 4 color, 23-28 cold test	.09	.09¼	.09	.09¼	.09	.09¼
200 vis., 5 color, 23-28 cold test	.08½	.08¾	.08½	.08¾	.08½	.08¾
240 vis., 3 color, 25-30 cold test	.12¼	.12½	.12¼	.12½	.12¼	.12½
240 vis., 4 color, 25-30 cold test	.11¾	.12	.11¾	.12	.11¾	.12
240 vis., 5 color, 25-30 cold test	.10¾	.11	.10¾	.11	.10¾	.11
280 vis., 3 color, 25-30 cold test	.13¾	.14	.13¾	.14	.13¾	.14
280 vis., 4 color, 25-30 cold test	.12¾	.13	.12¾	.13	.12¾	.13
280 vis., 5 color, 25-30 cold test	.11¾	.12	.11¾	.12	.11¾	.12
Cylinder Stocks:						
600, steam refined, light green	.09	.10	.09	.10	.09	.10
600, steam refined, dark green	.08	.09	.08	.09	.07	.08
190-200 vis., D color Bright Stock	.33	.35	.33	.35	.33	.35
150-160 vis., D color Bright Stock	.31	.33	.31	.33	.30	.32
150-160 vis., E color Bright Stock	.29	.31	.29	.31	.28	.30
Waxes:						
124-126 White Crude Scale Wax	.03⅜	.03½	.03⅜	.03½	.03⅜	.03½
PENNSYLVANIA:						
34 Neutral	.07¾	.08	.07¾	.08	.07½	.07¾
34 Sundebloom	.07¾	.08	.07¾	.08	.07⅞	.08
36 Miners' Neutral	.07¾	.08	.07¾	.08	.07¼	.07½
150, 3 color	.22½	.23	.21½	.22	.22½	.23
180, 3 color	.26	.26½	.26	.26½	.26	.26½
200, 3 color	.28½	.29	.28½	.29	.28½	.29
220, 3 color	.31	.31½	.31	.31½	.31	.31½
600, steam refined	.29½	.30	.26½	.27	.26½	.27
635, steam refined	.33½	.34	.29½	.30	.29½	.30
650, steam refined	.34½	.35	.31	.32	.34½	.35
600, Pennsylvania Flash	.35½	.36	.33	.34	.33	.34
630, Pennsylvania Flash	.39½	.40	.38½	.39	.38½	.39
600, E filtered	.31½	.32	.28½	.29	.27½	.28
600, D filtered	.35½	.36	.31½	.32	.31½	.32
Pennsylvania Bright Stock	.50		.47	.48	.47	.48
*122-124 White Crude Scale Wax	.03¾		.03¾		.04	
*124-126 White Crude Wax	.04		.04		.04¼	.04½

*At New York.

GULF COAST (South Texas)—						
No. 2 color, 100 vis., pale oil	.06½	.07	.06½	.07	.06½	.07
No. 3 color, 200 vis., pale oil	.09	.10	.09	.10	.09.	10
No. 3 color, 300 vis., pale oil	.10	.10½	.10	.10½	.10	.10½
No. 3½ color, 500 vis., pale oil	.11	.11½	.11	.11½	.11	.11½
No. 4 color, 750 vis., pale oil	.14	.14½	.14	.14½	.14	.14½
No. 5 to 6 color, 200 vis., red oil	.07½	.08	.07½	.08	.07½	.08
No. 5 to 6 color, 300 vis., red oil	.08½	.09	.08½	.09	.08½	.09
No. 5 to 6 color, 500 vis., red oil	.09½	.10½	.09½	.10½	.09½	.10½
No. 5 to 6 color, 750 vis., red oil	.12½	.13	.12½	.13	.12½	.13
No. 2½ color, 200 vis., pale filtered	.11	.12	.11	.12	.11	.12
No. 2½ color, 300 vis., pale filtered	.12	.13	.12	.13	.12	.13
No. 2½ color, 500 vis., pale filtered	.14½	.15	.14½	.15	.14½	.15
No. 2½-3 color, 750 vis., pale filtered	.17	.19	.17	.19	.17	.19
CALIFORNIA—						
130 vis., 2½-3 color	.10¼	.10½	.10¼	.10½	.10¼	.10½
200 vis., 2¼-3 color	.11½	.11¾	.11½	.11¾	.11½	.11¾
300 vis., 3-3½ color	.13	.13¼	.13	.13¼	.13	.13¼
350 vis., 3½-4 color	.13½	.13¾	.13½	.13¾	.13½	.13¾
400 vis., 3½-4 color	.15	.15½	.15	.15½	.15	.15½



REFINERY AND CRUDE PRICES

Quotations on refined products are for interstate or export movement unless otherwise noted.

Red Neutral:						
200 vis., 4½-5 color	.11	.11¼	.11	.11¼	.11	.11¼
300 vis., 5-6 color	.12	.12¼	.12	.12¼	.12	.12¼
400 vis., 5-6 color	.13¼	.14	.13¼	.14	.13¼	.14
500 vis., 4½-5 color	.15¼	.15½	.15¼	.15½	.15¼	.15½
500 vis., 5-6½ color	.15	.15¼	.15	.15¼	.15	.15¼
600 vis., 6½ plus color	.16	.16¼	.16	.16¼	.16	.16¼

Note: Bright stocks are not manufactured commercially on the Pacific Coast.

NEW YORK (BAYONNE) REFINERY PRICES

	Apr. 23		Apr. 16		Apr. 9	
Gasoline, U. S. Motor, 58-60 437	.09	.09¼	.09		.08¾	
Kerosene, water white, 41-43	.08	.08½	.08		.08	
*Fuel Oil, Bunker "C," 14-16, per bbl.	1.05		1.05		1.05	
†Fuel Oil, Diesel, 28-30, per bbl.	2.00		2.00		2.00	
Gas Oil, 32-36 gravity	.05	.05½	.05	.05½	.05	.05½
25 pale Paraffin Oil	.10½		.10½		.10½	
28 pale Paraffin Oil	.07¼		.07¼		.07¼	
285 red Paraffin Oil	.11½		.11½		.11½	
250 red Paraffin Oil	.11		.11		.11	
225 red Paraffin Oil	.09½		.09½		.09½	
200 red Paraffin Oil	.09		.09		.09	
Refined Wax:						
120-122 a.m.p., per lb.	.04⅜		.04½		.04⅝	
125-127 a.m.p., per lb.	.04¾		.04¾		.04⅞	
130-132 a.m.p., per lb.	.06		.06		.06	
133-135 a.m.p., per lb.	.06½		.06⅝		.06⅝	
135-137 a.m.p., per lb.	.06¾		.06⅞		.06⅞	
Petrolatum in barrels, carload lots, per pound.						
Dark green	.02		.02		.02	
Amber	.03½		.03½		.03½	
Extra amber	.03¾		.03¾		.03¾	
Cream	.06½		.06½		.06½	
Lily white	.07½		.07½		.07½	
Snow white	.08½		.08½		.08½	

*Lighterage 5.0 cents a barrel extra. †Lighterage 6.5 a barrel extra.

NEW YORK (BAYONNE) EXPORT PRICES

	Apr. 23	Apr. 16	Apr. 9
Kerosene, prime white	.08	.08	.08
Kerosene, water white	.09	.09	.09
600, steam refined cylinder stocks, in bbls.	.37	.33	.33
635, steam refined	.40	.36	.36
650, steam refined	.44	.40	.40
600, Pennsylvania flash	.47	.43	.43
630, Pennsylvania flash	.51	.48	.48
600, Warren E	.40½	.35½	.35½
600, Oil City E	.40	.35	.35
Light 140-150 Bright Stocks	.59	.56	.56
Dark 140-150 Bright Stocks	.57	.54 .54½	.54 .54½

LOS ANGELES EXPORT PRICES

	Apr. 23		Apr. 16		Apr. 9	
Kerosene, water white	.05½	.06	.05½	.06	.05½	.06
U. S. Motor Gasoline, 53-55, 437 e.p.	.07	.08	.07	.08	.07	.08

CRUDE OIL GRAVITY TABLE

Gravity—	Okla., Kans., N. C. Tex. 1	No. La. and Arkansas 2	Smackover, Ark. 3	Stephens, Ark. 4	Wheeler (Texas Panhandle) 5	Gray County (Texas Panhandle) 6	Carson and Hutchinson (Texas Panhandle) 7	Salt Creek, Wyo. 8	Grade B & Light Crude (G. Coast) 9	Somerset (South Central Texas) 10
24 and above	....	....	.90	....	....	....	....	....	....	....
Below 24	....	....	.75	....	....	....	....	....	....	....
Below 25	.60	....	....	....	....	....	....	....	1.05	....
25 to 25.9	.66	....	....	....	....	....	....	....	1.07	....
Below 26	....	....	....	....	....	....	....	....	....	....
26 to 26.9	.72	....	....	....	....	....	....	....	1.09	....
27 to 27.9	.78	....	....	....	....	....	....	....	1.11	....
Below 28	....	.78	....	.70	.70	.69	.72	....	1.13	....
28 to 28.9	.84	.84	....	.74	.70	.69	.72	....	1.13	....
29 to 29.9	.90	.90	....	.78	.70	.75	.72	.90	1.15	....
30 to 30.9	.96	.96	....	.82	.76	.81	.72	.96	1.17	....
31 to 31.9	1.02	1.02	....	.86	.82	.87	.72	1.02	1.19	....
32 to 32.9	1.08	1.08	....	.90	.88	.93	.78	1.08	1.21	1.05
33 to 33.9	1.11	1.13	....	....	.91	.96	.81	1.11	1.23	1.07
34 to 34.9	1.14	1.14	....	....	.94	.99	.84	1.14	1.25	1.09
35 to 35.9	1.17	1.17	....	....	.97	1.02	.87	1.17	1.27	1.11
36 to 36.9	1.20	1.20	....	....	1.00	1.05	.90	1.20	....	1.13
37 to 37.9	1.23	1.23	....	....	1.03	1.08	.93	1.23	....	1.15
38 to 38.9	1.26	1.26	....	....	1.06	1.11	.96	....	....	1.17
39 to 39.9	1.29	1.29	....	....	1.09	1.14	.99	....	....	....
40 to 40.9	1.32	1.32	....	....	1.12	1.17	1.02	....	....	....
41 to 41.9	1.35	1.35	....	....	1.15	1.20	1.05	....	....	....
42 to 42.9	1.38	1.38	....	....	1.18	1.23	1.08	....	....	....
43 to 43.9	1.41	1.41	....	....	1.21	1.26	1.11	....	....	....
44 and above	1.44	1.44	....	....	1.24	1.29	1.14	....	....	....

Column 1, Note—Magnolia Petroleum Co. posted schedule January 24, 1929, making price below 26 gravity 60 cents per barrel, 26-26.9 gravity 65 cents, 27-27.9 gravity 70 cents, 28-28.9 gravity 75 cents, 29-29.9 gravity 80 cents, 30-30.9 gravity 90 cents and 31-31.9 gravity $1, with balance of the price schedule as shown.

Oklahoma—Humble Oil & Refining and Carter Oil Co. January 24, Prairie Oil & Gas Co., Sinclair Oil & Gas Co., Gypsy Oil Co., The Texas Company, January 25.

North Central Texas—Including Ranger, Mexia, Powell, Richland, Wortham, Lytton Springs (Southwest Texas, Iatan and Panola, Iatan posted a flat price of 93 cents by Magnolia on January 14, 1928), Currie, Nocona and Moran. Prairie, Sinclair and Gulf, The Texas Company, January 25, Humble Oil & Refining Co., January 24.

Kansas—Prairie, Sinclair and The Texas Company, January 25; Carter, January 24.

Column 2—Arkansas and North Louisiana—[Caddo, Bull Bayou, Crichton, De Soto, Haynesville, Homer and El Dorado only], Standard Oil Co. of Louisiana, Louisiana Oil Refining Corp., Gulf Refining Co., Magnolia Petroleum Co., schedule effective January 26 applies to Pine Island, Haynesville, Bull Bayou, Louisiana, and El Dorado, Ark., light crude. The Texas Company January 24 posted prices below 28 gravity at 6 cents differential per degree with minimum of 60 cents for all below 24 gravity.

Column 3—February 6, Louisiana Oil Refining Corp.; February 7, Standard Oil Co. of Louisiana, The Texas Company, Gulf Refining Co., Magnolia Petroleum Co., and on February 10, Atlantic Oil Producing Co.

Column 4—Atlantic Oil Producing Co., Louisiana Oil Refining Corp., January 28.

Column 5, 6 and 7—Humble Oil & Refining Co., Magnolia Petroleum Co., January 24, 1929.

Column 8—Midwest Refining Co., January 25, 1929. All crude over 37 gravity $1.23 per barrel.

Column 9—Humble Oil & Refining Co. and other major buyers January 26 (schedule ends 35 and above), with exception of Magnolia Petroleum Co., which stops at 31 degrees gravity. Sun Pipe Line Co. and The Texas Company posted 2 cents differential for each degree above 35 gravity and 1.37 for 40 gravity and above.

Column 10—Grayburg Pipe Line Co. and Pioneer Oil & Refining Co., April 7.

CALIFORNIA CRUDE OIL PRICES

Standard Oil Co.-Union Oil Co. (Effective January 18, 1929)

Gravity—	Salt Lake, Potrero, Newport, Long Beach, Signal Hill, Alamitos, Richfield, Los Angeles, Fullerton, Torrance, Olinda-Brea, Alamitos Heights, Signal Hill, Seal Beach, Huntington Beach, Athens, Inglewood, Rosecrans-Dominguez, Watsonville 1	Whittier, La Habra, Coyote Hills 2	Midway-Sunset, Elk Hills, Lost Hills, Belridge, Buena Vista Hills 3	Montebello 4	Santa Fe Springs 5	Santa Maria, Coalinga 6	Wheeler Ridge, Fruitvale 7	Orcutt 8	Ventura, Rincon, Ventura Ave. 9	Elwood Terrace 10
14 to 14.9	.70	.70	.50	.70	....	.50	.50	.65	.70	....
15 to 15.9	.70	.70	.50	.70	....	.50	.50	.65	.70	....
16 to 16.9	.70	.70	.50	.70	....	.50	.50	.65	.70	....
17 to 17.9	.70	.70	.50	.70	....	.50	.50	.65	.70	....
18 to 18.9	.75	.75	.56	.70	....	.56	.56	.70	.75	....
19 to 19.9	.80	.80	.62	.75	....	.62	.62	.70	.80	....
20 to 20.9	.85	.84	.68	.80	....	.68	.68	.70	.85	....
21 to 21.9	.89	.88	.74	.85	.89	.74	.74	.86	.86	....
22 to 22.9	.93	.91	.80	.90	.92	.80	.80	.87	.87	....
23 to 23.9	.97	.94	.86	.95	.95	.85	.85	.90	.90	....
24 to 24.9	1.01	.97	.90	.98	.98	.88	.88	.94	.94	....
25 to 25.9	1.05	1.00	.95	1.01	1.01	.91	.91	.98	.98	....
26 to 26.9	1.09	1.04	1.00	1.04	1.04	.94	.94	1.02	1.02	....
27 to 27.9	1.13	1.08	1.05	1.07	1.07	.98	.97	....	1.06	....
28 to 28.9	1.17	1.12	1.10	1.10	1.10	1.02	....	....	1.10	....
29 to 29.9	1.21	1.16	1.16	1.13	1.15	1.06	....	....	1.14	....
30 to 30.9	1.25	1.20	1.22	1.16	1.20	1.10	....	....	1.18	....
31 to 31.9	1.30	....	1.28	....	1.25	1.14	....	....	1.23	....
32 to 32.9	1.35	....	1.34	....	1.30	1.18	....	....	1.28	....
33 to 33.9	1.41	....	1.40	....	1.35	1.22	....	....	1.34	....
34 to 34.9	1.47	....	1.46	....	1.40	1.26	....	....	1.40	1.16
35 to 35.9	1.53	....	....	....	1.45	1.30	....	....	1.46	1.22
36 to 36.9	1.59	....	....	....	1.50	....	....	....	1.52	1.28
37 to 37.9	1.65	....	....	....	1.55	....	....	....	1.58	1.34
38 to 38.9	1.71	....	....	....	1.60	....	....	....	1.64	1.40
39 to 39.9	1.77	....	....	....	1.65	....	....	....	1.70	1.46
40 to 40.9	1.83	....	....	....	....	....	....	....	1.76	1.52
41 to 41.9	1.89	....	....	....	....	....	....	....	1.82	1.58
42 to 42.9	1.95	....	....	....	....	....	....	....	1.88	1.64

Kern River, Newhall-McKittrick, Mount Poso and Round Mountain 11 to 13.9 gravity 45 cents, 14 gravity and above 50 cents, effective October 2, 1929. On December 1, 1928, the Union Oil Co. posted Midway-Sunset, Elk Hills, Buena Vista, Lost Hills and Coalinga crude as follows: 11 to 13.9 gravity at 45 cents, 14 gravity and above 50 cents.

Column 1—Signal Hill, Seal Beach, Huntington Beach and Alamitos Heights crude, 14 to 32.9 gravity, inclusive; Richfield, Olinda-Brea and Fullerton, 14 to 30.9 gravity; Torrance and Inglewood, 14 to 28.9 gravity, Dominguez and Athens-Rosecrans, 24 to 42.9 gravity.

Column 2—Whittier crude, 14 to 22.9 gravity; Coyote Hills, 14 to 30.9 gravity.

Column 3—Kern River, Newhall and McKittrick, 11 to 19.9 gravity; Midway-Sunset, Buena Vista and Elk Hills, 11 to 33.9 gravity; Lost Hills, 11 to 34.9 gravity; oil below 14 gravity posted at 45 cents.

Column 6—Oil below 14 gravity posted at 45 cents.

Columns 8 and 9 posted by Union Oil Co. only.

CRUDE OIL PRICES

OKLAHOMA, KANSAS, NORTH AND EAST CENTRAL TEXAS

Corsicana heavy (January 11)* ..... .80
Other fields .....See gravity table

*Posted by Magnolia Petroleum Co.

TEXAS PANHANDLE

Gray County, Wheeler County and Carson-Hutchinson Counties—See gravity table.

WEST TEXAS

Iatan* .....Same as North Texas
Crane-Upton-Crockett, Pecos, Winkler and Glasscock (July 26)‡ .....$ .65
Chalk† ..... .65
Mitchell† ..... .65

*Includes Howard County and Westbrook Fields.

†Magnolia Petroleum Co., January 26, 1929.

‡Posted by Humble Oil & Refining Co., Magnolia Petroleum Co., and Gulf Pipe Line Co.

ARKANSAS-NORTH LOUISIANA

Cotton Valley (Below 36 gravity April 11) .....$ .75
Bellevue 1.20
Urania (April 22) 1.00
East El Dorado (March 16, 1927) 1.00
Other fields.....See gravity table

Cotton Valley crude above 36 gravity takes same gravity price schedule as shown for North Louisiana and Arkansas crude in Mid-Continent gravity price table.

Note—Cotton Valley and Bellevue posted by Standard Oil Co. of Louisiana, Louisiana Oil Refining Co., Gulf Refining Co., and Magnolia Petroleum Co.; Urania posted by Louisiana Oil Refining Corp.; East El Dorado, Pierce Junction and Spindletop.) do, Magnolia Petroleum Co., Gulf Refining Co.

GULF COAST

(Goose Creek, Hull, Liberty, West Columbia, Orange, Boling, Sour Lake, Humble, Sugarland, Raccoon Bend, High Island, Grade A (March 14)* $1.20
Grade B .....See gravity table
Jennings, La. (March 14)† $1.05
Saratoga, Batson, Daytona (March 14, 1927)‡ 1.20
Markham (March 14)‖ 1.00
High Island (December 14)† 1.00

*Humble Oil & Refining Co. and other major buyers. †Gulf Pipe Line Co. ‡Sun Pipe Line Co. ‖The Texas Company.
¶Posted by Gulf Pipe Line Co.

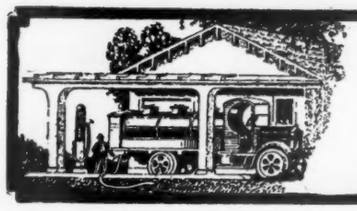
ROCKY MOUNTAIN STATES

Ohio Oil Co.-Midwest Refining Co.

(Effective January 25, 1929)

Rock Creek, Wyo. $1.18
Salt Creek .....See gravity table
Big Muddy $1.28
Grass Creek, heavy (July 27, 1928) ..... .90
Grass Creek, light 1.36
Mule Creek (May 1, 1928) 1.10
Elk Basin 1.36
Lance Creek 1.38
Poison Spider (March 14, 1927) 1.00
Notches (March 14, 1927) ..... .65
Rex Lake (February 22) 1.10
Osage 1.38
Lost Soldier (contract) 1.00
Hamilton Dome (March 14, 1927) ..... .85
Greybull 1.57
Cat Creek (Montana) (July 27, 1928) .. 1.48
Sunburst (Montana) (May 18, 1928) .. 1.65
Torchlight 1.38

(Continued on Page 142)



TANK WAGON MARKETS

Tank wagon quotations for gasoline and kerosene in United States as furnished by the larger marketing concerns April 23.

ALL TANK WAGON AND SERVICE STATION QUOTATIONS INCLUDE TAXES

STANDARD OIL CO. (INDIANA)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Chicago dist.†..	14.0	15.0	...	13.0
Decatur, Ill. ...	14.2	15.2	...	13.1
E. St. Louis....	13.4	14.4	...	12.2
Joliet	14.4	15.4	...	13.3
Peoria	14.2	14.0	...	13.1
Quincy	14.2	15.2	...	12.9
Davenport, Ia...	17.5	18.5	3.0	13.3
Des Moines.....	17.5	18.5	3.0	13.3
Keokuk	17.5	18.5	3.0	13.3
Sioux City	17.1	18.1	3.0	12.9
Duluth, Minn...	17.5	18.5	2.0	13.9
Mankato	17.1	18.1	2.0	13.7
Minneapolis ...	17.2	18.2	2.0	13.9
La Crosse, Wis..	17.2	18.2	2.0	14.0
Milwaukee	16.1	17.1	2.0	12.9
Madison	16.3	17.3	2.0	13.1
Detroit, Mich...	17.8	18.8	3.0	14.7
Grand Rapids..	17.7	18.7	3.0	14.6
Saginaw	17.9	18.9	3.0	14.8
Evansville, Ind..	18.0	19.0	4.0	14.0
Fort Wayne....	18.4	19.4	4.0	14.4
Indianapolis ...	18.2	19.2	4.0	14.2
South Bend	18.4	19.4	4.0	14.4
Fargo, N. D....	18.9	19.9	2.0	15.9
Huron, S. D....	19.3	20.3	4.0	14.7
Sioux Falls	18.1	19.1	4.0	14.4
K. C., Mo.*	16.9	17.9	3.0	11.6
Springfield* ...	16.8	17.8	3.0	12.5
St. Louis*	15.9	16.9	2.5	12.3
St. Joseph	16.5	17.5	3.0	12.2
Wichita, Kans.	15.8	16.8	3.0	11.8
Bartlesville, Ok.	15.5	16.5	3.0	11.5

*State tax 2 cents; remainder city tax.
†Effective February 20, discounts on Q.D.A. in Chicago district 2 cents off service station price on purchases of 500 gallons or more per month and 4 cents on purchases of 1,000 gallons or more per month.

NAPHTHA

	Tank wagon	Tank car
Oleum spirits	14.7	11.9
V. M & P. naphtha	16.3	12.9
Cleaner's naphtha	16.0	13.9
Stanisol	17.0	14.4

Tank wagon prices f.o.b. Chicago; tank car prices f.o.b. Whiting. Cleaner's naphtha price of 16 cents and Stanisol 17 cents effective March 24.

STANOLIND FURNACE OIL IN CHICAGO

Less than 100 gallons	9.0
100 to 799 gallons	8.0
800 or more gallons	7.5

Note—Outside Chicago furnace oil discount of 1 cent per gallon is given on deliveries of 100 to 349 gallons and 1½ cents on deliveries of 350 gallons or more.

The following quantity discounts from the service station price are allowed on monthly sales of gasoline: 2,000 gallons or less, 2 cents; more than 2,000 and less than 6,000 gallons, 2½ cents; more than 6,000 gallons, 3 cents. Discounts are allowed each month, and they are not cumulative. Delivery tickets showing date and quantity delivered must be sent to the seller before the tenth of the month to secure the discount on the previous month's purchases.

ATLANTIC COAST DISTRICT

Standard Oil Co. (New Jersey)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Atlantic City...	16.0	20.0	2.0	13.0
Newark, N. J...	16.0	20.0	2.0	13.0
Annapolis, Md..	18.0	22.0	4.0	13.0
Baltimore	18.0	22.0	4.0	12.0
Cumberland ...	18.0	22.0	4.0	13.0
Washington ...	16.0	20.0	2.0	12.0
Danville, Va....	19.0	23.0	5.0	13.0
Norfolk	19.0	23.0	5.0	13.0
Petersburg	19.0	23.0	5.0	13.0
Roanoke	19.0	23.0	5.0	13.0
Richmond	19.0	23.0	5.0	13.0
Charles'n, W.Va.	18.0	22.0	4.0	13.0
Keyser	18.0	22.0	4.0	13.0
Parkersburg ...	18.0	22.0	4.0	13.0
Wheeling	18.0	22.0	4.0	13.0
Charlotte, N. C.	19.0	23.0	5.0	13.0
Hickory	19.0	23.0	5.0	13.0
Mt. Airy	19.0	23.0	5.0	13.0
Salisbury	18.0	20.0	5.0	13.0
Charls'ton, S.C..	20.0	24.0	6.0	13.0
Columbia	20.0	24.0	6.0	13.0

OHIO

Standard Oil Co. (Ohio)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Ohio points* ..	17.0	18.0	3.0	†14.0

*Dealers and commercial accounts 2 cents under tank wagon.
†Service station price 16 cents.

PENNSYLVANIA-DELAWARE AND PART NEW ENGLAND

The Atlantic Refining Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Pittsburgh, Pa..	16.0	*21.0	...	14.0
Philadelphia ..	16.0	*21.0	...	14.0
Scranton	16.0	*21.0	...	14.0
Allentown	16.0	*21.0	...	14.0
Altoona	16.0	*21.0	...	14.0
Erie	13.0	*21.0	...	14.0
Dover, Del. ...	19.0	21.0	3.0	14.0
Wilmington ...	19.0	21.0	3.0	14.0
Springf'd, Mass.	18.0	20.0	2.0	15.0
Worcester	18.0	20.0	2.0	15.0
Boston	18.0	20.0	2.0	15.0
Providence, R.I.	15.0	16.0	2.0	15.0
Hartford, Conn.	18.0	20.0	2.0	14.0
New Haven ..	17.0	18.0	2.0	15.0

*Includes tax of 3.0 cents. Pennsylvania tax is collected by the dealer and paid by him direct to the state. The Atlantic Refining Co. recognizes a 2-cent per gallon discount on gasoline from its posted tank wagon markets on sales to dealers for purposes of resale. The Atlantic Refining Co. also recognizes a maximum discount of 3 cents per gallon on gasoline to commercial accounts under contract for one year.

NEW YORK AND PART OF NEW ENGLAND DISTRICT

Standard Oil Co. (New York)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Albany, N. Y...	16.0	18.0	...	15.0
New York*	16.0	18.0	...	15.0
Buffalo	16.0	18.0	...	14.0
Rochester	16.0	18.0	...	14.0
Syracuse	16.0	18.0	...	15.0
Boston, Mass. ..	18.0	20.0	3.0	15.0
Augusta, Me. ..	20.0	22.0	4.0	15.0
Manch't'r, N.H.	20.0	22.0	4.0	15.0
Burlington, Vt..	19.0	20.0	4.0	15.0

*Prices in steel barrels.

SOUTHERN DISTRICT

Standard Oil Co. (Kentucky)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Atlanta, Ga. ..	21.0	21.0	4.0	16.5
Augusta	21.0	23.0	4.0	15.5
Macon	21.0	22.0	4.0	16.5
Savannah	20.0	22.0	4.0	15.5
Birm'ham, Ala..	18.0	20.0	4.0	13.0
Mobile	21.0	23.0	4.0	15.0
Montgomery ..	22.0	24.0	4.0	16.5
Clarks'le, Miss..	21.0	23.0	5.0	13.5
Jackson	20.0	23.0	5.0	13.0
Natchez	20.5	22.5	5.0	14.0
Gulfport	22.5	24.5	5.0	14.0
Vicksburg	20.5	22.5	5.0	14.0
Jack'ville, Fla..	22.0	24.0	5.0	14.5
Miami	23.0	25.0	5.0	15.5
Pensacola	23.0	25.0	5.0	14.5
Tampa	22.0	24.0	5.0	14.5
Lexington, Ky..	20.0	22.0	5.0	15.5
Covington	20.0	21.0	5.0	15.5
Louisville	20.0	22.0	5.0	15.0
Ashland	19.0	20.0	5.0	15.5
Catlettsburg ..	19.0	20.0	5.0	15.5

In addition to the state tax of 4 cents on gasoline, Montgomery has city tax of 1 cent on gasoline and one-half cent on kerosene. Kerosene prices in Georgia include 1-cent tax. In Florida, an inspection fee of 0.125 cent; in Alabama, an inspection fee of one-half cent on kerosene and one-fourth cent on gasoline. Pensacola and Mobile taxes include 1-cent city levy. Gulfport tax includes privilege tax of 2 cents in addition to state tax.

PACIFIC COAST TERRITORY

Standard Oil Co. (California)*

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
San Francisco .	19.0	23.0	3.0	15.5
Los Angeles ..	18.5	22.5	3.0	15.5
Reno, Nev.	24.0	26.0	4.0	19.0
Portland, Ore...	19.5	23.5	3.0	16.5
Seattle, Wash..	18.5	22.5	2.0	16.5
Tacoma	18.5	22.5	2.0	16.5
Spokane	22.5	26.5	2.0	20.5
Phoenix, Ariz..	18.0	22.0	4.0	20.5

NEBRASKA

Standard Oil Co. (Nebraska)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Omaha	18.25	20.25	4.0	13.25
McCook	19.75	21.75	4.0	14.75
Norfolk	18.75	20.75	4.0	13.75
N. Platte	19.75	21.75	4.0	14.5
Scottsbluff ...	19.75	21.75	4.0	14.25

CENTRAL SOUTH DISTRICT

Standard Oil Co. (Louisiana)

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
N. Orleans, La.*	15.5	19.5	5.0	16.0
Baton Rouge...	14.0	18.0	4.0	14.5
Alexandria	15.0	19.0	4.0	16.0
Lafayette†	16.0	20.0	5.0	14.0
Lake Charles†.	16.5	20.5	5.0	16.0
Shreveport	15.0	19.0	4.0	15.0
Knoxv'le, Tenn.	20.0	24.0	5.0	16.0
Memphis	18.0	23.0	5.0	12.5
Chattanooga ...	19.5	23.5	5.0	16.0
Nashville	19.0	21.0	5.0	16.0
Bristol	20.0	23.0	5.0	14.0
Lit. Rock, Ark..	17.0	21.0	5.0	13.0

*Tax of 5 cents includes city tax of 1 cent. Louisiana kerosene prices include 1-cent state tax and 1-cent parish tax. †Five-cent tax includes 1-cent tax in Lafayette Parish.
†Includes 1-cent parish tax.

SOUTHWESTERN DISTRICT

Magnolia Petroleum Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Dallas, Tex. ...	13.0	17.0	2.0	13.0
Fort Worth ...	13.0	16.0	2.0	13.0
Houston	14.0	18.0	2.0	13.0
San Antonio ..	13.0	17.0	2.0	12.0
El Paso	17.0	20.0	2.0	16.0
Texarkana	16.0	20.0	2.0	13.0
Muskogee, Ok.*	15.0	18.0	3.0	13.0
Okla. City*	13.0	17.0	3.0	12.0
Tulsa*	15.0	18.0	3.0	11.0
Ft. Smith, Ark.	15.0	19.0	5.0	12.0
Little Rock ...	17.0	21.0	5.0	13.0

*Gasoline tank wagon price to dealers 2 cents under posted tank wagon.

ROCKY MOUNTAIN DISTRICT

Continental Oil Co.

	Gasoline			Kero.
	Tank wagon	Service station	Incl'ds tax of	tank wagon
Denver, Colo...	18.0	21.0	3.0	15.5
Pueblo	18.0	21.0	3.0	15.5
Grand Junction.	21.5	24.5	3.0	19.0
Casper, Wyo. .	19.0	22.0	4.0	14.0
Cheyenne	20.0	23.0	4.0	15.5
Butte, Mont. ..	24.5	27.5	5.0	20.0
Helena	24.5	27.5	5.0	20.0
Salt Lake, Utah	21.0	24.0	3.5	17.0
Albu'que, N. M.	21.0	24.0	5.0	17.0
Boise, Idaho....	23.5	26.5	4.0	19.0
Twin Falls	23.5	26.5	4.0	19.0

TANK WAGON CHANGES

April 15—Continental Oil Co. advanced gasoline tank wagon price 4 cents and service station 5 cents at Denver, Colo. Standard Oil Co. of Louisiana advanced gasoline tank wagon and service station 1 cent at Lake Charles, La., due to 1-cent tax which became effective on that date.

April 16—Standard Oil Co. of Louisiana reduced gasoline service station price 2 cents at Nashville, Ky. Continental Oil Co. advanced gasoline tank wagon and service station price 1 cent at Pueblo, Colo.

April 18—Standard Oil Co. of Ohio advanced gasoline tank wagon and service station price 1 cent in Ohio due to increase in state tax from 2 to 3 cents.

April 18—Magnolia Petroleum Co. reduced gasoline tank wagon and service station price 1 cent at Oklahoma City.

Standard Oil Co. of Kentucky advises of following changes not previously announced: March 23 gasoline tank wagon reduced 2 cents and service station 3 cents at Ashland and Catlettsburg, Ky. April 1—Reduced gasoline service station 2 cents at Augusta, Ga.

CRUDE PRICE CHANGES

April 22—Louisiana Oil Refining Corp. advanced Urania, La., crude oil from 90 cents to $1.00.

VETERAN OIL MAN CELEBRATES

CHATHAM, Ontario, Apr. 20.—James Peat, since 1870 an active figure in the Canadian oil industry, on April 9 celebrated his eighty-seventh birthday at his home at Petrolia, Ontario. Mr. Peat is recognized as a leading authority on the Canadian oil industry. He is the only living charter member of Washington Lodge, A.F.&A.M., of Petrolia, and has been an active figure in the municipal life of the Canadian oil town.

TO INCREASE MINNESOTA TAX

CHICAGO, Apr. 20.—The proposal to increase the gasoline tax in Minnesota from 2 to 3 cents has been approved by the lower branch of the state legislature and has been favorably received by the upper body. The governor favors the increase.

The measure provides that a complete inventory of all stocks of gasoline within the State must be made when the tax goes into effect. The plan is to make the tax effective May 1, in which event the jobbers will be obliged to take an accurate inventory of their supplies of gasoline at all their stations on April 30.

CRUDE OIL PRICES

(Continued from Page 141)

Artesia (July 27, 1928)	1.08
Hogback (New Mexico) (July 27, 1928)	1.43

Note—Salt Creek, Osage, Cat Creek, Greybull and Hogback posted by Midwest Refining Co., and the remainder by the Ohio Oil Co. Both companies post Grass Creek light and Elk Basin.

SOUTH CENTRAL AND SOUTHWESTERN TEXAS

Luling (January 11)*	$ .80
Mirando (January 7)†	.80
Salt Flat (April 8, 1929)§	1.00
Rockdale-Minerva (April 15):	
Below 28 gravity	1.25
28-38.9 gravity	1.27
39-39.9 gravity	1.29
40 and above	1.31
Thrall‡	...
Callihan (May 16)	1.75
Lytton Springs (Lockhart)	See gravity table
Somerset	See gravity table

*Posted by Magnolia Petroleum Co.
†Magnolia Petroleum Co., Humble Oil & Refining Co., Crown Central Pipe Line Co.
‡Thrall prices same as North Central Texas less 19½ cents per cwt. freight.
§Humble Oil & Refining Co.

EASTERN STATES

(Effective January 4, 1929)

Penna Grade Oil in New York Transit Lines (New York)	$4.10
Bradford District Oil in National Transit Lines (Pennsylvania)	4.10
Penna Grade Oil in National Transit Lines (Pennsylvania)	4.00
Penna Crude Oil in Southwest Pennsylvania Lines (West Virginia)	4.00
Penna Grade Oil in Eureka Pipe Line Lines (Pennsylvania)	3.90
Penna Grade Oil in Buckeye Pipe Line Lines (Ohio)	3.85
Cabell Grade Oil in Eureka Pipe Line Lines (West Virginia) (March 12) ..	1.45
Corning 35-cent Grade Oil in Buckeye Pipe Line Co.'s Line (January 25, 1929)	1.65
Corning 25-cent Grade Oil in Buckeye Pipe Line Co.'s Lines (January 25, 1929)	1.75
Somerset Oil in Cumberland Pipe Line Lines (Kentucky) (March 12, 1929) ..	1.50
Ragland Grade Oil in Cumberland Pipe Line Lines (Kentucky) (Jan. 29)	.60

MIDDLE WESTERN STATES

Ohio Oil Co.
(Effective January 25, 1929)

Lima	$1.50
Wooster	1.62
Illinois	1.45
Indiana	1.27
Princeton	1.45
Plymouth	1.18
Waterloo (November 17, 1926)	1.35
Western Kentucky	1.53
Dundee, Mich. (April 15, 1929)**	.70
Midland, Mich. (April 15, 1929)*	1.50
Saginaw, Mich., Saginaw Sand (February 10)†	1.89
Saginaw, Mich., Berea Sand (February 10)†	1.79
Cumberland, Clay, Barren, Clinton and Monroe Counties, Kentucky, (March 16)‡	1.50
Oil in line in Stoll Oil Refining Co. in Oil City, Ky. (Mar. 16, 1929)§	1.50
Oil Springs (Canada)¶	1.97
Petrolia (Canada)¶	1.90

*Posted by Pure Oil Co.
†Posted by Sun Oil Co.
‡Posted by Paragon Development Co.
§Posted by Stoll Oil Refining Co.
¶Posted by Imperial Oil Co., Ltd.
**Posted by Standard of Indiana.

MEXICAN CRUDE

Panuco heavy (f.o.b. Mexican ports) ..	$1.15

Note—Due to the fact that the exportation of Tuxpan light crude has become a negligible factor, prices will no longer be published.

Your engine will perform better with the *Correct* gasoline *Selected* from these 3!

CERTAINLY you want to get out of your engine *all* the performance that's built into it. Only the *right* gasoline will do it!

To help you obtain the RIGHT gasoline for *your* car, Sinclair has produced the "Three-Gas" Service. *Three* gasolines of the finest quality. Each one is *all*-gasoline, nothing added—Yet each one is different, having certain qualities all its own and sold upon its merits—for superior performance.

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No longer do you have to buy the gasoline that's just right for somebody else's car—use the one that's best for yours! Drive in and select it wherever you see the Sinclair Sign.

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Accumulation in Oil Securities Seen

Buying Attributed to Improved Outlook in Mid-Continent and West Texas, With Promise of Lowered Production in California

Signs of accumulation of the better grade of oil shares by large financial interests were observable the last week. Pan-American issues, Simms, Skelly and Independent Oil & Gas were among the oils that moved into new high levels. The active buying was attributed in great measure to the improved situation in the Mid-Continent and West Texas areas, with California starting on a curtailment program. Wilcox and Simms were showing special strength. Sinclair displayed a sagging tendency. Marland, Barnsdall A, The Texas Corporation, Atlantic Refining, Phillips and Shell Union were among the favorites.

Earnings in 1928

Profits of companies in general were higher in 1928 than in 1927. For a group of 20 representative companies, the increase amounted to 81.43 per cent. Only one of these companies, Marland Oil, showed a deficit for both years.

The companies, with earnings for 1928 and 1927 in tabular form as compiled by Ernst & Ernst, accountants, follow:

	Net profits	
	1928	1927
Amerada Corp.	$2,214,109	$3,706,715
Atlantic Ref. Co.	16,848,807	2,315,714
Barnsdall Corp.	4,047,414	4,229,796
Gulf O. Corp. of Pa.	36,347,608	13,717,218
Humble O. & R. Co.	19,277,146	7,111,738
Marland Oil Co.	*4,987,564	*7,691,077
Mid-Cont. Pet. Corp.	3,897,056	3,298,575
Ohio Oil Co.	5,054,956	3,510,372
Phillips Pet. Co.	5,960,171	4,937,931
Prairie O. & G. Co.	10,541,598	2,356,062
Richfield O. Co., Cal.	7,818,076	3,742,884
Skelly Oil Co.	4,104,376	1,438,228
Stand. O. Co. of Cal.	46,083,817	40,210,953
Stand. O. Co. of Ind.	†55,515,296	30,132,456
Stand. O. Co. of Ky.	4,745,604	4,492,008
Stand. O. Co. of Ohio	3,896,548	2,335,042
The Texas Corp.	44,967,534	20,029,405
Tide Wtr. Assoc. Oil	18,329,683	8,288,012
Union O. Co. of Cal.	11,101,935	10,048,494
Vacuum Oil Co.	37,659,458	25,559,899
Total	$333,423,628	$183,770,425

Percentage increase, 81.43 per cent.
*Deficit.
†Exclusive of special cash dividend of $21,821,870 from subsidiary.

Twenty Representative Stocks

The Oil and Gas Journal's weekly average price of 20 representative petroleum stocks listed on the New York Stock Exchange and New York Curb, based on closing quotations for Saturday, was as follows:

January 26	57.44
February 2	57.55
February 9	55.28
February 16	55.35
February 23	54.92
March 2	56.43
March 9	55.96
March 16	58.63
March 23	58.52
March 30	58.57
April 6	58.26
April 13	58.52
April 20	62.77

Independent Oil & Gas

Independent Oil & Gas Co. and subsidiaries, including Manhattan Oil Co., report for quarter ended March 31, 1929, net profit of $2,018,850 after interest, taxes, depreciation and depletion, equivalent to $1.51 a share earned on 1,333,572 no-par shares of stock. This compares with net loss of $419,398 in first quarter of 1928.

Shaffer Oil & Refining

Report of Shaffer Oil & Refining Co. and subsidiaries for year ended December 31, 1928, shows profit after taxes and interest of $3,104,122 available for depreciation, depletion, dividends, etc., compared with $1,821,188 in 1927.

Cities Service Co.

Reports of Cities Service Co. shows consolidated net earnings of the company and its subsidiaries were $64,048,047, an increase of $3,930,055 over net earnings in 1927. Gross earnings were $167,255,672 compared with $158,028,257 for the preceding year. Total assets on December 31, 1928 amounted to $913,592,354 compared with $809,036,357 in 1927. This was an increase of over $104,000,000 in one year. Consolidated current assets of the company and its subsidiaries were $129,680,266, an increase of $26,451,264. The excess of current assets over current liabilities was $67,094,466 as compared with $52,932,860 in 1927.

Pennok Oil

Thomas W. Streeter, Edward Cornell, O. L. Gubelman and Edward T. Moore were elected directors of Pennok Oil Corp. at the annual meeting. These, with Thomas J. Megear, Ernest Stauffen, Jr., and John L. Weeks, constitute the executive committee of Simms Petroleum Co.

More than 51 per cent of the stock of Pennok Oil has been deposited in exchange for Simms stock under the recent offer, thus making the merger plan operative.

Atlantic Refinery

Preliminary report of Atlantic Refining Co. and subsidiaries for quarter ended March 31, 1929, shows net profit of $3,892,600 after reserves for taxes, depreciation, etc., equivalent after dividend requirements on 7 per cent preferred stock, to $1.77 a share (par $25) earned on 2,000,000 shares of common stock. This compares with $1,357,357 or 50 cents a share on common in first quarter of 1928, based on present share basis.

Illinois Pipe Line

With the stock selling at 309 on the New York Curb Exchange, reports are current that a four-for-one splitup in Illinois Pipe Line Co. is in the offing. There are at present 200,000 shares of $100 par capital stock authorized and outstanding.

Illinois Pipe submits only a balance sheet. Additions to surplus account in 1928 amounted to $5.68 a share, which with dividends of $16 a share paid during the year indicated earnings of $21.68 a share on the 200,000 shares outstanding, against $19.06 for 1927 figured on the same basis.

Texas Pacific

Texas Pacific Coal & Oil Co. declared a dividend of 2½ cents in stock, payable June 30 to stock of record June 5. On March 20 a similar dividend was paid.

At the annual meeting directors were re-elected. R. E. Harding has been elected a member of the executive committee.

Phillips Petroleum

At the annual meeting of stockholders of Phillips Petroleum Co. John G. Phillips of Bartlesville and Charles A. Lemp of St. Louis were elected to fill the existing vacancies on the board. L. E. Phillips was elected chairman of the executive committee, John H. Kane, executive vice president; Clyde Alexander, vice president, general manager. Three new vice presidents, P. J. McIntyre, J. S. Dewar and J. M. Sands were elected. All other officers were re-elected.

Frank Phillips, president, announced that the company's earnings for the first quarter were $3,612,879.56, after all charges except depletion and depreciation compared with $3,105,091.17 for the corresponding period last year.

The income account for the first quarter of 1929 is as follows: Gross income, $8,516,441.53; expenses, $4,903,561.97. Net profit after all charges, including Federal and state taxes, but before depletion and depreciation, $3,612,879.56.

Lago Oil

Report of Lago Oil & Transport Corp. and subsidiaries for year ended December 31, 1928, shows consolidated net profit of $2,066,502, after depreciation, depletion, Federal taxes and proportion of profit applicable to minority interest, equivalent to 51 cents a share earned on 3,992,394 shares of no-par stock. This compares with $7,947,020 or $1.99 a share on 3,992,132 shares in 1927.

Superior Oil

Superior Oil Corp. reports for year ended December 31, 1928, net loss of $662,152 after interest, depreciation, depletion, etc., comparing with net loss of $545,058 in 1927.

Consolidated balance sheet of Superior Oil Corp. as of March 2, 1929 (after giving effect to acquisition of Moody Corp. and sale of 400,000 shares of capital stock) follows:

Assets: Property, plant and equipment, less depreciation and depletion $16,198,125; stock in other companies $79,586; deferred items $75,456; cash $2,878,283; notes and accounts receivable $399,695; inventories $573,002; total $20,204,147.

Liabilities: Capital stock (represented by 2,324,938 no-par shares) $16,906,115; notes payable $2,805,441; accounts payable $546,853; accrued accounts $86,815; deferred liabilities $1,000,000; profit and loss deficit $1,141,077; total $20,204,147.

International Petroleum

Shareholders of International Petroleum Co., Ltd., meeting at Sarnia, Ontario, approved conversion of each $5 par share of preferred stock into two shares of $2.50 par, and conversion of each common no-par share into two no-par common shares. Issue and allotment of unissued shares was left to the directorate. The split will not affect dividends payable on stock. The new stock will

INDEPENDENT OILS ON NEW YORK CURB

Quotations Compiled by Francis, Bro. & Co., Kennedy Building, Tulsa, Okla.

1926 High	1926 Low	1927 High	1927 Low	1928 High	1928 Low	Par value	Stocks	For week ended April 19 Sales	Open	High	Low	Last	
$6.75	.45	2⅞	.55	1½	.53	$5	Amer. Con. Oilfields	4,500	59	59	52	59	+ 3
..	..	7½	2¾	9½	3⅛	N.P.	Amer. Maracaibo	2,400	5	5	4⅞	4⅞	— ⅛
..	..	2¾	1	4½	2¼	$10	Argo Oil	5,300	3⅝	3⅞	3½	3¾	.....
85¼	60	40	20½	55	32¾	N.P.	British American	No sales.					
28⅜	9¼	28¼	15½	4½	3⅞	25c	Carib. Syndicate (new)	2,700	2¾	2⅞	2⅝	2⅞	+ ⅛
..	..	58¾	40¼	90⅞	54	$20	Cities Service	34,400	117½	117½	113½	115	— 2
..	..	95⅜	87	103½	94½	100	Cities Service, pfd.	1,900	97¼	97¾	96½	97⅜	.....
..	..	8⅞	7⅜	9⅝	8⅞	10	Cities Service, pfd. B	100	9¼	9¼	9¼	9¼	.....
3½	1¾	3⅞	1⅛	3¼	76	1	Colombia Syndicate	3,700	1¼	1¼	1⅛	1⅛	.....
..	..	9¾	6⅜	8⅞	6¼	10	Consolidated Royal	800	8¼	8¾	8	8¾	— ¼
16	10	14⅞	9½	17½	9½	N.P.	Creole Syndicate	16,500	9	9	8¾	9	— ⅛
..	..	3	.50	3¼	.76	N.P.	Crown Central	4,900	1⅞	2½	1¾	2⅜	+ ⅝
7⅞	6¾	12	4	33½	3¼	N.P.	Darby Petroleum	4,500	17	18	17	18	.....
..	..	2½	74	2¼	1	N.P.	Derby Oil & Refining	100	3½	3½	3½	3½	— ⅜
..	..	16¾	4	21⅛	7½	N.P.	Derby Oil & Refining, pfd.	No sales.					
..	..	2	.40	.53	.15	N.P.	Gilliland ctfs.	No sales.					
98	92	118	86¼	165	101⅛	$25	Gulf Oil Corp.	8,800	158⅞	167⅛	158	158	— 2½
$3.00	.83	2½	.80	3⅜	1	5	Intercontinental Pet.	5,500	2	2	1¾	1⅞	.....
..	..	2¼	1⅛	3	1¼	N.P.	Kirby Petroleum	1,200	2	2	2	2	.....
12¼	5¾	10⅞	5⅛	9⅜	5⅛	25	Leonard Oil & Dev.	1,600	5	5⅛	5	5⅛	.....
27	20	27½	20	43⅞	20	N.P.	Lion Oil & Refining Co.	6,000	31¾	35⅞	31¾	35¾	.....
46	30	59⅜	37	69⅛	48⅛	$25	Lone Star Gas	1,900	69	69¾	68	69½	.....
2⅞	1	2⅞	.80	1⅞	.50	1	Magdalena Syndicate	2,700	66	69	60	60	— 5
34	12½	52	12	48½	32	N.P.	Margay Oil	No sales.					
8	5½	12⅛	5	8	2¾	N.P.	Mexico-Ohio Oil	200	4½	4½	4½	4½	.....
1¾	1⅛	1½	1	1¾	.76	$1	Mountain & Gulf	3,300	1⅛	1¼	1⅛	1¼	+ ⅛
26	23	29¼	22¾	28⅞	19½	10	Mountain Producers	1,400	19	19½	19	19½	.....
6⅝	5	5⅞	4⅝	5⅝	4¼	5	New Bradford	800	4¼	4¾	4⅛	4⅝	+ ⅝
..	..	16	9¼	11⅞	7⅛	1	New Mex. & Ariz.	2,300	7½	7⅝	7⅜	7½	+ ¼
..	..	12¾	9½	14¼	8½	N.P.	North Central Texas	2,800	10¼	10⅞	10¼	10⅞	.....
10⅛	5⅞	9⅜	3¼	6	2½	N.P.	Pandem	2,900	2½	2⅝	2⅜	2½	+ ⅛
12¼	11¾	12⅛	7	15⅝	8½	N.P.	Pantepec Oil	5,700	8¼	8½	8	8	— ⅛
22¾	12	13½	5⅛	7¾	4⅞	N.P.	Pennok Oil	1,300	5¾	7	5¼	7	+ 2
17	8½	24⅜	7	18	4⅞	25	Red Bank Oil	2,900	12½	13⅞	12½	13⅞	+ 2⅜
30¼	12	15½	3½	12⅞	4½	N.P.	Reiter-Foster	2,500	5½	5½	5⅛	5⅛	— ⅛
7	4½	7	4½	12	4⅛	N.P.	Ryan Consolidated	100	7⅜	7⅜	7⅜	7⅜	.....
10	7⅛	8	5¼	7¼	5½	$10	Salt Creek Cons.	1,100	4	4	3¾	4	+ ⅜
35	24⅛	35½	27¼	35	23⅛	10	Salt Creek Prod.	4,200	23⅞	23⅞	22	22½	— 1¼
6⅞	1¼	7	1¼	3½	1	5	Savoy Oil	400	2	2¼	2	2¼	+ ¼
27	7⅝	26½	17	22⅞	13	10	Tidal Osage	3,000	16¼	16⅞	15⅝	16	+ ¾
25¾	7⅝	23¾	15	21¼	13⅛	10	Tidal Osage, nonvoting	4,000	16	16½	15	15½	.....
92	63½	92	63½	93¾	75	100	Transcontinental, pfd.	800	87	87	83	85	.....
8	4½	7⅜	4¼	9⅛	4¾	5	Venezuelan Petrol	1,600	4⅞	4⅞	4¾	4⅞	+ ⅛
8⅛	5½	8	4¾	8¼	4⅞	$1	Woodley Petroleum	2,000	6⅛	6⅛	6	6	— ⅛
6½	6	6	1¾	8⅜	2⅛	25	Y Oil & Gas (new)	100	2¾	2¾	2¾	2¾	— ¼

TRANSACTIONS IN OIL SHARES ON NEW YORK STOCK EXCHANGE

Quotations Compiled by Francis, Bro. & Co., Members of New York Stock Exchange, Kennedy Building, Tulsa, Okla.

1926 High	1926 Low	1927 High	1927 Low	1928 High	1928 Low	Listed	capital	Par value	Stocks—	Div. rate	Last paid	For week ended April 18— Sales	Open	High	Low	Last	Change
32⅞	24¼	37⅝	27⅝	43⅞	27⅛	(sh)	922,075	N.P.	Amerada Corp.	50cQ	Oct. 31, 28	12,200	34¾	34¾	32⅛	34	— ¼
74	39⅞	82⅛	35⅛	85	51¼	(sh)	209,180	N.P.	American Republics Corp.	.....	.....	7,000	60⅛	60½	57	68⅜	— 1¼
60	44¾	50¼	35	53⅜	37½		$57,260,300	$25	Associated Oil	50cQ	Dec. 31, 28	12,000	45	46	45	46	+ 2¾
128⅜	97	131⅜	104	66⅜	50		50,000,000	25	Atlantic Refining	25cQ	Dec. 15, 28	141,400	57⅞	61¼	57⅜	60½	+ 2¼
33½	23½	35½	20¾	53	20		35,194,000	25	Barnsdall Corp.	50cQ	Feb. 5, 29	66,100	43⅞	45⅜	43⅞	44½	— ½
94¼	50	96⅜	65	94⅞	68		20,785,400	100	General Asphalt	.....	.....	49,600	76⅝	78½	75¾	76	+ 3½
72	50¼	175¾	60⅛	167	79		25,000,000	100	Houston Oil	.....	.....	67,800	100½	104⅞	100	102½	— ½
34	19⅝	32¾	17⅝	38⅜	21¾	(sh)	959,457	N.P.	Independent Oil & Gas	50cQ	Jan. 31, 29	185,200	35⅛	38⅜	35	38¼	+ 2⅜
12¾	7½	12⅛	7⅝	39⅝	9		8,203,080	$10	Indian Refining	.....	May 31, 24	82,200	49½	51	46½	47⅝	— 3
25⅞	16½	37¾	20½	39⅛	27⅜	(sh)	3,992,122	N.P.	Lago Oil & Transport	.....	May 1, 27	12,700	33	33½	31¼	31½	— ⅞
19⅞	12	18⅛	10	19¾	9¾	(sh)	1,237,078	N.P.	Louisiana Oil Refining	.....	.....	9,000	15¼	15½	14½	14½	— ⅞
28	16½	22¾	12	25½	12½	(sh)	330,000	N.P.	Maracaibo Oil	.....	.....	7,400	16	18½	15	17	+ 3
63⅜	49¼	58½	31	49¾	33	(sh)	2,316,692	N.P.	Marland Oil Co.	.....	Mar. 31, 27	62,300	42½	43¼	41¼	41⅜	— ¾
13¾	6	9¼	3	73	4⅝	(sh)	945,939	N.P.	Mexican Seaboard	.....	Dec. 15, 20	74,300	49⅞	51⅜	48	49⅜	— ⅝
37	20½	39⅜	25½	44½	25⅛	(sh)	1,357,461	N.P.	Mid-Continent Petroleum	50cQ	Feb. 15, 29	43,700	34⅞	36¾	34⅝	36¾	+ 1⅜
104¼	90	105	97	120½	103¼		$6,718,000	$100	Mid-Continent Petroleum pfd.	$1.75Q	Sept. 1, 28	No sales.					
2½	½	3¾	1⅝	7⅜	2⅜		24,298,850	10	Middle States	.....	July 1, 23	8,600	4½	4⅝	4¼	4¼	+ ¼
76⅛	56⅛	65⅞	40⅛	54⅞	38¼		$48,807,400	$50	Pan American P. & T.	.....	Oct. 20, 27	32,200	59	62½	58	62½	+ 4
78⅜	56⅞	66⅜	40¼	58⅞	37¾		121,097,900	50	Pan American P. & T. B.	.....	Nov. 15, 24	494,600	61	65⅛	59¼	64½	+ 4½
46	30	37⅞	16¾	28⅝	15½	(sh)	400,000	N.P.	Pan American Western B	.....	Jan. 30, 27	600	15	15	14¾	15	.....
32	4½	18⅞	8	21¾	11½	(sh)	198,770	N.P.	Panhandle P. & R.	.....	.....	2,700	13½	13⅞	13	13	— ⅝
99⅜	51	83	54	108	70		$2,935,200	$100	Panhandle P. & R. pfd.	.....	July 2, 23	200	64	65	64	65	+ 3
57⅝	40	60¼	36¼	53⅞	35¼	(sh)	2,406,796	N.P.	Phillips Petroleum	37½cQ	Jan. 2, 29	84,600	42¼	44⅜	41⅛	44	+ 1⅞
....	....	1⅛	½	5¼	½		$29,622,925	$25	Pierce Oil Corp.	.....	.....	5,200	2¾	3	2⅝	2⅝	— ⅜
7	2¼	5½	2½	7	3½	(sh)	2,500,000	N.P.	Pierce Petroleum	.....	.....	3,900	5	5	4⅞	5	+ ⅛
60¼	48	55½	45⅝	68	46		60,000,000	25	Prairie Oil & Gas	.....	Aug. 31, 27	8,300	61½	62⅜	60⅝	61	— ⅛
137½	122½	190	130¾	280	172		$101,250,000	$25	Prairie Pipe	75cQ*	Mar. 31, 29	5,700	56¾	57	56⅛	56⅞	+ ⅜
20¾	11	33⅞	16¾	29⅞	16		$37,450,850	$50	Producers & Refiners	.....	Sept. 15, 23	4,500	23¼	24⅜	22	22	.....
41¾	30¾	50	36⅞	49⅝	41		2,845,350	50	Producers & Refiners pfd.	.....	May 1, 25	30,000	43	45	43	43¾	+ ¾
31	25¼	33½	25	31⅝	19		75,959,350	25	Pure Oil Co.	25cQ	Dec. 1, 28	17,000	26¾	114½	112½	114	+ 1½
27½	22	28⅝	25⅝	56	23		47,025,000	$25	Richfield Oil	.....	Nov. 15, 28	23,300	44	45¼	43¼	45	+ ¼
57⅜	47⅜	54½	44¼	64	44⅝	(sh)	611,303	13.40	Royal Dutch, N. Y. shares	50cQ	Jan. 10, 29	2,500	52¾	54	52	52⅞	+ ½
48⅝	40½	47⅞	41⅜	57½	40⅝	(sh)	£30,000,000	£1	Shell Transport & T.	$1.455	July 23, 28	100	46½	46½	46½	46½	.....
31	24	31¾	24⅝	39¼	23¼	(sh)	20,000,000	N.P.	Shell Union Oil	35cQ	Dec. 31, 28	105,400	30½	31¼	29⅞	30¾	+ ¼
28⅝	15⅛	26⅜	14¼	27¼	18½		$8,357,000	$10	Simms Petroleum	10cQ	Dec. 15, 28	155,500	23½	26⅜	21⅞	25¾	+ 3¾
24⅞	16¾	22⅜	15	46¾	17⅜	(sh)	4,501,915	N.P.	Sinclair Consolidated	.....	.....	303,600	38¾	40½	38⅜	39¾	+ ½
99½	90	104½	97	110	102½		$16,604,600	$100	Sinclair Consolidated pfd.	$2Q	Nov. 15, 28	400	109¼	109½	109½	109½	+ ½
37⅛	26⅝	37⅜	24⅛	42⅝	25		27,396,590	25	Skelly Oil Co.	50cQ	Dec. 15, 28	185,100	41⅞	46	40½	45	+ 4¼
63⅝	51½	60¾	50⅜	80	53	(sh)	12,594,098	N.P.	Standard Oil of California	65½cQ	Dec. 15, 28	143,600	79½	80¾	78⅜	79	— 1
46⅜	37½	41⅜	35⅛	59⅜	37¾		$611,120,700	$25	Standard Oil of New Jersey	25cQ*	Dec. 15, 28	221,400	59⅜	60⅝	58¾	60	+ ¼
47¼	30⅜	34⅛	29¾	44¼	28¾		427,973,275	25	Standard Oil of New York	40cQ	Dec. 15, 28	57,200	43⅞	44⅜	43½	43⅝	— ⅜
41⅝	30⅛	34⅞	30	77	31½	(sh)	1,206,073	N.P.	Sun Oil	25cQ	Dec. 15, 28	2,400	60¼	64⅜	62⅛	63⅛	+ ¼
5¼	1	6½	3⅛	14¼	2½	(sh)	1,267,000	N.P.	Superior Oil Corp.	.....	Dec. 20, 20	1,611	9	10¼	9	9½	.....
58	48	58	45	74¾	50		$211,076,650	$25	The Texas Corporation	75cQ	Jan. 1, 29	46,500	64¼	68½	65¼	67¾	+ 1¾
19½	12	18⅞	12	26⅝	12⅛		8,380,340	10	Texas Pacific Coal & Oil	.....	Jan. 3, 28	35,900	21¼	21⅞	20⅝	21	— ½
39¼	27	29⅛	19	41½	19⅝	(sh)	2,168,410	N.P.	Tide Water Oil Co.	20cQ	Dec. 15, 28	42,700	20¼	21½	20¼	20¾	+ ⅛
103	87¼	90⅛	85	100⅛	86		$20,705,200	$100	Tide Water Oil Co. 5% pfd.	$1.25Q	Nov. 15, 28	1,100	86½	89	86¼	89	+ 2¾
27	20⅞	19⅛	15¾	25	14⅜	(sh)	4,796,158	N.P.	Tide Water Associated	.....	Aug. 1, 27	4,400	33½	35½	33⅛	35½	+ 2½
5½	3	10⅜	3¾	14¾	7¼	(sh)	3,742,029	N.P.	Transcontinental Oil	.....	.....	1,444	10¼	11⅞	10⅝	11	+ ¼
58⅜	37¼	56⅛	39⅝	58	42¾		$94,798,100	$25	Union Oil of California	50cQ	Nov. 10, 28	76,700	50½	54½	51¼	52½	+ ¼
120⅜	84¼	127½	94	128⅛	110		31,061,200	100	Union Tank Car Co.	$1.25Q	Dec. 1, 28	500	136	141¼	134	141	+ 7
30⅛	23½	34½	24½	44⅞	26	(sh)	356,000	N.P.	Warner Quinlan	50cQ	Jan. 2, 29	10,900	34⅛	35	34	34⅜	+ ⅛
29¾	25⅛	27½	20	38	20⅛	(sh)	490,000	N.P.	White Eagle Oil & Refining	50cQ	Jan. 20, 29	4,700	37¼	36⅞	35½	36½	+ ⅜
									Wilcox Oil & Gas	.....	.....	3,000	23	24½	23	23	.....

*Also extras.

STANDARD OIL STOCKS ON NEW YORK CURB

21	16	21⅝	17⅞	22⅜	14⅞		£4,126,460	£1	Anglo-American Oil	.....	June 6, 28	900	16¾	16¾	16	16	— ⅝
....	....	3¾	¾	5	1¼	(sh)	500,000	N.P.	Atlantic Lobos	.....	.....	200	3¾	3¾	3¾	3¾	.....
76	65	69	50	56½	44½		1,000,000	25	Borne Scrymser	$1S.A.	Oct. 15, 28	100	39	39	30	39	.....
59½	42	60	45	76	53		10,000,000	50	Buckeye Pipe Line	$1Q	Dec. 15, 28	300	71¼	71⅞	71⅛	71½	+ ½
82½	65	126	76½	161	117½		3,000,000	25	Chesebrough Mfg.	$1Q	Dec. 28, 28	300	160	165	160	165	+ 7
25⅞	17½	22⅝	16¼	23	16		36,057,840	10	Continental Oil	.....	Dec. 15, 27	25,900	24⅝	25	24	24	+ 2⅝
137	102	137	89	114	67		1,500,000	50	Cumberland Pipe Line	$1A	Dec. 15, 28	No sales.					
63¾	43	68½	47	88	64⅛		5,000,000	100	Eureka Pipe Line	$1Q	Nov. 1, 28	.....	60	60	60	60	.....
32½	9⅞	13½	3½	13	4¼		16,000,000	100	Galena Signal Oil	.....	June 30, 25	200	5½	5½	5½	5½	.....
68½	52	68½	54	114¾	59¼		73,117,577	25	Humble Oil & Refining	30cQ*	Jan. 1, 29	41,100	116¼	119⅞	111½	116¼	+ 4¼
144½	125½	182	123¾	290½	176½		20,000,000	100	Illinois Pipe Line	10%S.A.	Dec. 15, 28	5,150	309¾	320	309¼	319¾	+11¾
....	....	64¾	37¾	104	56¾	(sh)	6,458,267	N.P.	Imperial of Canada	25cQ	Dec. 1, 28	113,600	116¼	119⅞	113½	116	+ 2⅝
72½	58	94½	61	91⅞	74⅜		$5,000,000	$50	Indiana Pipe Line	$1Q	Feb. 15, 29	1,200	93	97	92	92	— 4¾
35½	28¾	39	28¼	55	35	(sh)	7,123,444	N.P.	International Petroleum	25c	Nov. 30, 28	2,300	29	30⅜	28½	29	.....
20¾	12½	24	13½	32⅜	19⅜		$6,363,350	12.50	National Transit Co.	25c	Dec. 15, 28	3,300	24¼	24⅜	23	24	+ ⅞
51½	27¼	44½	31¼	75	38½		5,000,000	100	New York Transit	.....	July 15, 26	3,500	79	84	79	80¼	.....
80½	64	100	70	69	56½		2,000,000	50	Northern Pipe Line	$3S.A.	Jan. 2, 29	No sales.					
67¾	55¾	67⅞	52	84	58½		60,000,000	25	Ohio Oil Co.	50cQ*	Dec. 15, 28	6,900	69½	73¾	69¼	73	+ 5¾
24¾	15	39	12	84	28		10,000,000	25	Penn Mex. Fuel	$1.25	Dec. 15, 28	1,000	32	32¼	30	32¼	+ 1¾
220	84½	201½	175½	220	167		4,000,000	100	Solar Refining	$5S.A.	Dec. 20, 28	200	40¼	40¼	40¼	40¼	.....
74½	61½	27¼	15½	19	15		1,000,000	10	Southern Pipe Line	$2	Dec. 1, 27	2,400	20	21⅞	19⅛	19⅛	— 2¼
50	34½	41½	35	71⅞	36¾		2,000,000	25	South Penn Oil	50cQ	Dec. 31, 28	18,000	50½	54⅛	48	53⅜	+ 5⅜
56	47½	83	55½	102	70		3,500,000	100	Southwest Pa. Pipe Lines	$1Q	Oct. 1, 28	No sales.					
70½	60½	81½	64⅝	95⅞	70⅞		228,415,463	25	Standard Oil of Indiana	62½cQ	Dec. 15, 28	37,000	59¾	60⅝	59½	59⅞	+ ½
36½	16½	20⅞	14⅝	27¾	15		8,000,000	25	Standard Oil of Kansas	.....	June 16, 24	700	19⅛	19½	19⅛	19½	+ ⅜
134⅜	108	130	111½	179¾	122¼		17,012,559	10	Standard Oil of Kentucky	$1Q	Dec. 31, 28	6,900	40	40½	39⅜	40	+ ⅛
51⅛	42	49½	40	54⅞	39⅞		4,559,850	25	Standard Oil of Nebraska	63cQ	Dec. 20, 28	200	48	48¼	48	48⅛	.....
372	288	87½	72	134	71		14,000,000	25	Standard Oil of Ohio	62½cQ	Jan. 2, 29	2,600	117½	127½	116¾	123	+ 6
21	15	21	14½	23½	16		861,000	25	Swan Finch Co.	.....	Nov. 1, 19	100	15½	15½	15½	15½	.....
109⅜	90¼	....	....	111	72		125,619,000	25	Vacuum Oil	75cQ	Dec. 20, 28	7,700	126½	129	124¼	126	+ 1½

*Also extras.

be available for issue about June 15. There are 7,152,404 shares of common and 100,000 shares of preferred issued, and 12,737,956 shares of common not issued.

Oklahoma Gas & Electric

Report of Oklahoma Gas & Electric Co. and subsidiaries for the year ended December 31, 1928, shows profit of $4,478,845 after interest and taxes, etc., but before depreciation, amortization, etc., comparing with profit of $3,535,687. Company has oustanding 185,710 shares (par $100) of 7 per cent preferred stock and 100,000 shares (par $100) of common stock.

Pan American

Edward G. Seubert, president and chief executive of the Standard Oil Co. of Indiana, has issued this statement:

"The reports appearing in current newspaper issues to the effect that the directors of the Standard Oil Co. of Indiana will shortly make an offer to acquire the minority stock interest in the Pan American Petroleum & Transport Co. are without foundation."

Canadian Oil Companies

Shareholders of Canadian Oil Companies, Ltd., of Toronto will be asked at a special general meeting on April 26 to approve an increase of the authorized common shares from 96,000 to 192,000. New stock will be allotted to shareholders on the basis of one new share at $33 for every two shares now held.

E. W. MARLAND FORMS ANOTHER OIL COMPANY

Organization of the E. W. Marland Co., Inc., the new oil producing unit formed by E. W. Marland and other former officers of the Marland Oil Co., has been announced. Authorized capital of the new company is 500,000 no-par shares, divided equally between Class "A" and Class "B."

The Class "A" shares will be sold for cash to provide working capital, close to 25 per cent of this issue having already been suscribed for by E. W. Marland and associates. The Class "B" shares have been set aside for payment of salaries of officers and employes. Provision is made that until dividends aggregating $10 a share shall have been paid or set aside for payment on Class "A" stock, the Class "B" shares do not participate in dividends. After that both share alike in dividends.

E. W. Marland is chairman of the board of the new company. Other officers and directors are C. C. Brown, president; A. W. McCoy, vice president; I. G. Harmon, vice president and treasurer; G. R. Marland; H. L. McCracken, secretary; and H. R. Kent, assistant secretary and assistant treasurer.

COMMISSIONER FOR INDIANS

WASHINGTON, April 20.—Secretary Wilbur of the Department of the Interior has announced the appointment by the President of Charles James Rhoads of Philadelphia to be Commissioner of Indian Affairs. Mr. Rhoads is a member of Brown Brothers, Bankers, of Philadelphia. His father had been associated with organizations favorable to the Indians for many years. Mr. Rhoads has been President of the Indian Rights Association for the past year. In announcing the new Commissioner Secretary Wilbur said: "The fundamental aim of the Bureau of Indian Affairs shall be to make of the Indian a self sustaining, self respecting American citizen just as rapidly as this can be brought about."

WILDCAT OPERATIONS IN WEST TEXAS

(Continued from Page 54)

Ray E. McCamey et al's No. 1 McCutchen, 2,300 ft. S and 786 ft. W of NE cor. of T. J. Hines Sur. No. 4 ... Drlg. 492 ft.

CONCHO COUNTY

Jones & Leiner's No. 1 Jones, 420 ft. S and 15 ft. E of NW cor. John G. Reh Sur. No. 1,878 ... Drlg. 1,100 ft.

CROCKETT COUNTY

Eppenaur et al's No. 2 Noelke, 500 ft. N and 1,250 ft. E of SE cor. Sec. 64, Blk. 1, L&G.N.R.R. Sur. ... Shut down 460 ft.

Lewis & Daniels' No. 1 Pecos River Bed, 19 yards S and 37 degrees E of NW cor. Sec. 33, Blk. 1, I.&G.N. Sur... Cleaning out 620 ft.

W. W. Donnelly & Young's No. 1 Shannon, SW SW SE Sec. 42, Blk. BB, T.C.R.A. Sur. ... Total depth 1,110 ft.

W. W. Donnelly & Young's No. 1 Middlebuster, C Sec. 11, Blk. 9, D.&S.E. Sur. ... 7,000,000 ft. gas at 1,662 ft.; shut down 1,755 ft.

W. A. Moncrief et al's No. 1 Massie, 1,170 ft. N and 1,320 ft. E of SW cor. Sec. 47, Blk. UV, G.C.&S.F. Sur. ... Drlg. 400 ft.

J. D. Wheeler's No. 1 State Land, 744 ft. S and 1,250 ft. E from SE cor. Sec. 73, Blk. 1, I.&G.N.R.R. Sur., but in Vacancy Strip ... Top salt 492 ft.; set 8-in. casing 595 ft.; drlg. 1,397 ft.

CULBERSON COUNTY

Deep Rock Oil Co. et al's No. 1 Kloh-Rumsey, 800 ft. S and 1,422 ft. E of NW cor. Sec. 33, Blk. 59, Twp. 7, T.&P.R.R. Sur. ... Drlg. 1,460 ft., anhydrite.

Hickey & Stiver's No. 1 C. O. Finley, 660 ft. N and 1,980 ft. W Sec. 20, Blk. 82 ... Small oil show 1,331 ft.; pipe set 1,418 ft.; drlg. 1,865 ft.

W. S. Ellyer's No. 1 McGregor, C NW Sec. 14, Blk. 81.. Shut down 720 ft. for water.

Scott & Dittman's No. 1 Miller, 1,160 ft. N and 2,480 ft. E Sec. 1, Blk. 97, Public School Land ... Rainbow 1,056 ft.; 300 ft. sulphur water 1,725 ft.; shut down 1,800 ft.

FISHER COUNTY

Bickerstaff et al's No. 1 McWhirter, 2,640 ft. E and 150 ft. N of SW cor. of Sec. 295, Blk. 2, H.&T.C. Sur. ... Shut down 2,000 ft. for orders.

Cranfill & Reynolds' No. 2 Willingham, 1,980 ft. S and 2,310 ft. W of NE cor. Sec. 207, B.B.B.&C.R.R. Sur. .. Fishing 3,316 ft.

Cranfill & Reynolds' No. 1 Fleming, 1,980 ft. S and 2,310 ft. E of NW cor. Sec. 207, B.B.B.&C.R.R. ... Oil show 2,905 ft.; set 6-in. 3,160 ft.; shut down 3,218 ft.

Dunnegan Bros.' No. 1 T. Henry, 330 ft. N and E of SE cor. Sec. 21, George W. Burdett Sur. No. 322, but in Sec. 4, Robert Hibbett Sur. No. 331 ... Total depth 2,920 ft.; underreaming 2,885 ft.

Gillman-McMurray & French's No. 1 Cleveland, 781 ft. N and 1,336 ft. W of SE cor. Sec. 116, Blk. 2, H.&T.C. Sur. ... Drlg. 2,870 ft.

Landreth Prod. Corp.'s No. 1 Cooper, 440 ft. SE of NE cor. NW Sec. 115, Blk. 1, H.&T.C. Sur. ... Show oil 2,760-70 ft.; shut down 3,385 ft.

Mesa Oil Co.'s No. 1 Griffin, 849 ft. N and 465 ft. E of NE cor. Sec. 20, School Land ... Drlg. 2,390 ft.

Roeser & Pendleton's No. 1 Haugh, 440 ft. S and 1,320 ft. E of NW cor. of SW of Sec. 191, B.B.B.&C.R.R. Sur. ... Fishing 1,965 ft.

Texas-Phillips' No. 1 Hall, 330 ft. N and W of SE cor. Sec. 6, Blk. 20 ... Drlg. 2,260 ft.

White Eagle Oil & Ref. Co.'s No. 1 Hughes, 4,942 ft. S and 560 ft. W of NE cor. Cosby Sur. 220 ... Drlg. 1,450 ft.

GAINES COUNTY

Pure Oil Co.'s No. 1 A. A. Williamson, 1,650 ft. S and 330 ft. W of NE cor. Sec. 110, Blk. H. D.&W.R.R. ... Top salt 2,339 ft.; fishing 4,124 ft.

GARZA COUNTY

Emerald Oil Co.'s No. 1 J. S. Reed, 990 ft. W and 330 ft. N of SE cor. Sec. 135, Blk. 5, H.&C.N.R.R. Sur. ... Location.

GLASSCOCK COUNTY

Chas. Daniel et al's No. 1 Meek, 2,310 ft. W and 1,650 ft. N of SE cor. Sec. 7, Blk. 34, Twp. 3s, T.&P. Sur. .. Shut down 500 ft.

R. R. Penn's No. 1 Hughes-Johnson, C NW Sec. 45, Blk. 30, W.&N.W. Sur. ... Drlg. 3,305 ft.

Meriweather Oil Co.'s No. 2 McDowell, 1,492 ft. N and 150 ft. E of SE Sec. 35, Blk. 34, Twp. 2s, T.&P. Sur. .. Hole full water 2,665 ft.; set 6-in casing 2,700 ft.; drlg. 3,430 ft.

World Oil Co.'s No. 1-C McDowell, 1,650 ft. S and 2,310 ft. W of NE cor. Sec. 21, Blk. 34 ... Shut down 2,153 ft.

HOWARD COUNTY

American Maracaibo Co.'s No. 1 Settles-D, 330 ft. S and 1,650 ft. E of NW cor. Sec. 158, Blk. 29, W.&N.W. R.R. Sur. ... Cem. 8¼-in. casing.

American Maracaibo Co.'s No. 5 Settles-C, 330 ft. S and W of NE cor. Sec. 6, Blk. 32, Twp. 2s, T.&P. ... 300 qts. 2,212-27 ft.; total depth 2,285 ft.; cleaning out.

California Co.'s No. 5 Roberts, Lease 2, 1,170 ft. S and 150 ft. W of NE cor. Sec. 156, Blk. 29, W.&N.W.R.R. Sur. ... Shut down 1,696 ft.

California Co.'s No. 1 Settles, 2,310 ft. N and W of SE Sec. 158, Blk. 28, W.&N.W. Sur. ... Drlg. 3,253 ft.

Cosden & Co.'s No. 4 Dora Roberts-C, 200 ft. W and 1,520 ft. N of SE cor. Sec. 128, Blk. 29, W.&N.W. Sur. ... Drlg. 1,261 ft.

Cranfill & Reynolds' No. 1 Kloh-Rumsey, 353 ft. N and 150 ft. W of SE cor. Sec. 3, Blk. 32, Twp. 3s, T.&P.R.R. Sur. ... Cleaning out 2,396 ft.

Empire Gas & Fuel Co.'s No. 3 Clay, 1,315 ft. N and 1,570 ft. W of SE cor. Sec. 127, Blk. 29, W.&N.W. R.R. Sur. ... Drlg. 1,504 ft.

F.H.E. Oil Co.'s No. 11-B Dora Roberts, 1,700 ft. S and 2,310 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W. Sur. ... Fishing 2,510 ft.

F. H. E. Oil Co.'s No. 5-D Dora Roberts, 2,310 ft. S and 1,650 ft. E of NW cor. Sec. 136, Blk. 29 ... Set 6-in. casing 2,930 ft.; shut down.

Fuhrman Pet. Co.'s No. 1 Read, 2,310 ft. N and 330 ft. E of SW cor. Sec. 41, Blk. 32, Twp. 1n, T.&P.R.R. Sur... Location.

Gibson & Johnson's No. 1 Read, 660 ft. N and W of SE cor. Sec. 47, Blk. 30, Twp. 1n, T.&P.R.R. Sur. ... Drlg. 481 ft.

Green et al's No. 1 Slaughter, C SW Sec. 32, Blk. 31, Twp. 3n, T.&P.R.R. Sur. ... Drlg. 2,525 ft.

L. C. Harrison et al's No. 1 G. M. Podge Est., SE cor. Sec. 9, Blk. 30, Twp. 1s, T.&P. Sur ... Top lime 1,825 ft.; show oil 2,972-74 ft.; hole full fluid 3,257 ft.; total depth 3,257 ft.; cleaning out 2,936 ft.

Hyer & Yates' No 4 Clay, 990 ft. S and 1,650 ft. W of NE cor. Sec. 155, Blk. 29 ... Set 6-in. casing 1,557 ft.; drlg. 1,812 ft.

Magnolia Pet. Co.'s No. 2 Hyman, 1,320 ft. W and 1,320 ft. N of SE cor. Sec. 88, Blk. 29, W.&N.W. Sur. ... Rig..

Magnolia Pet. Co.'s No. 13 Dora Roberts, 2,440 ft. N and 1,650 ft. E of SW cor. Sec. 136, Blk. 29, W.&N.W. Sur. ... Rigging up standard tools 2,927 ft.; shut down.

Marland Prod. Co.'s No. 3 Clay-F, 250 ft. S and 660 ft. W of NE cor. Sec. 138, Blk. 29, W.&N.W.R.R. Sur. ... Shut down 2,675 ft. with show oil 2,595-2,675 ft.

Marland Prod. Co.'s No. 1 Clay-I, 210 ft. E and 1,520 ft. N of SW cor. Sec. 127, Blk. 29, W.&N.W.R.R. Sur. ... Rig.

Marland Oil Co.'s No. 1 Clay-H, 330 ft. S and 990 ft. W of NE cor. Sec. 155, Blk. 29 ... Location.

Marland Oil Co.'s No. 2 Clay-H, 990 ft. S and W of NE cor. Sec. 155, Blk. 29 ... Location.

Marland Prod. Co.'s No. 6 Clay, 330 ft. N and E of SW cor. Sec. 139, Blk. 29, W.&N.W.R.R. Sur. ... Drlg. 1,765 ft.

Midwest Exploration Co.'s No. 4 Clay-C, 330 ft. N and W of SE cor. Sec. 138, Blk. 29, W.&N.W.R.R. Sur. ... Drlg. 1,482 ft.

Moody Oil Corp.'s No. 13 D. Roberts, 2,310 ft. S and 2,260 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W.R.R. Sur... Drlg. 1,506 ft.

Plymouth Oil Co.'s No. 2 Kloh et al, 990 ft. S and 1,650 ft. W of NW cor. Sec. 5, Blk. 32, Twp. 2s, T.&P. R.R. Sur. ... Drlg. 1,590 ft.

Plymouth Oil Co.'s No. 3 Kloh et al, 1,650 ft. S and 990 ft. E of NW cor. Sec. 5, Blk. 32, Twp. 2s, T.&P. R.R. Sur. ... Drlg. 940 ft.

Schermerhorn Oil Co.'s No. 6 D. Roberts-A, 1,650 ft. S and 330 ft. W of NE cor. Sec. 137, Blk. 29, W.& N.W.R.R. Sur. ... Rig.

Superior Oil Co.'s No. 14 Dora Roberts-B, 2,310 ft. E and 330 ft. S of NW cor. Sec. 137, Blk. 29, W.&N.W. Sur. ... Shut down 200 ft.

Superior Oil Co.'s No. 15 Dora Roberts-B, 2,310 ft. S and 330 ft. E of NW cor. Sec. 137, Blk. 29, W.&N.W. R.R. Sur. ... Underreaming 2,565 ft.

Ward Oil Co.'s No. 7 Roberts, 2,310 ft. N and 330 ft. E of SW cor. Sec. 137, Blk. 29, W.&N.W.R.R. Sur. ... Drlg. 2,235 ft.

HUDSPETH COUNTY

American Land Co.'s No. 1 Lockhart & Roseborough, C SE Sec. 5, School Blk. 21 ... Total depth 260 ft.; shut down; tools moved off.

California Co.'s No. 1 University, 3,821 ft. N and 2,554 ft. E of SW cor. Sec. 19, Blk. E ... Set 16-in. casing 591 ft.; drlg. 976 ft.

Western States Oil Co.'s No. 1 Moore, C SE Sec. 16, Blk. 71, Twp. 6, T.&P. Sur. ... Straightreaming 2,700 ft.; total depth 2,865 ft.; fishing job.

Western States Oil Co.'s No. 1 Gardner & Moseley, NE NW Sec. 12, Blk. 18 ... Hole full water 2,945 ft.; underreaming 8¼-in. casing at 3,840 ft.; shut down 3,140 ft.; trying to pull casing.

IRION COUNTY

Fuhrman Pet. Co.'s No. 1 J. O. Suggs, Lease 1, C SE Sec. 3,024, Blk. 24, H.&T.C. Sur. ... Location.

Fuhrman Pet. Co.'s No. 1 J. D. Suggs, Lease 2, C SW Sec. 3,009, Blk. 24, H.&T.C. Sur. ... Top salt 920 ft.; drlg. 1,350 ft.

Kimbrough & Flinchbaugh's No. 1 Tankersley, 160 ft. S and 200 ft. W of NE cor. Sec. 712, Ford Willig Sur... Drlg. 1,081 ft.

Kimbrough & Tuel's No. 1 J. M. Nutt, 1,920 ft. S, 200 ft. E of NW cor. Sec. 5, Gonzales Co. School Land.... Set 6-in. casing 1,360 ft.; show oil and gas; shut down 1,400 ft.

Signal Oil Co.'s No. 2 Suggs, 5,240 ft. from N line and 996 ft. from W line, Sec. 23, Blk. 27, H.&T.C. Sur. ... Top salt 760 ft.; set 15-in. casing 1,360 ft.; set 8-in. casing 2,150 ft.; drlg. 2,850 ft.

F. E. Webb et al's No. 1 J. M. Nutt ... Shut down 2,511 ft.

Wesley West et al's No. 1 J. D. Suggs, SE NW SE Sec. 19, Blk. 7, H.&T.C. Sur. ... Top pay 3,368 ft.; swabbed 35 bbls. oil and 40 bbls. water; 35.8 gravity oil; show oil 5,480-82 ft.; show oil 5,660-70 ft.; drlg. 6,105 ft., black lime.

JEFF DAVIS COUNTY

J. K. Hughes Dev. Co.'s No. 2 Means, 1,622 ft. N line, 600 ft. W line Sec. 345, H.&T.C. Sur. ... Show gas 3,271 ft.; fresh water 3,000-05 ft.; underreaming 5 3/16-in. casing; shut down.

JONES COUNTY

Condor Pet. Co.'s No. 1 McDonald, 340 ft. S and 240 ft. W of NE cor. Lot 59, G. A. Kirkland Sur. A-550 .... Drlg. 1,700 ft.

J. E. Brewer's No. 1 Goodman, 150 ft. N and E of SW cor. Sec. 15, Blk. 19, T.&P.R.R. Sur. ... Location.

Cosden & Herbert Oil Co.'s No. 1 Bickley, 320 ft. N and 319 ft. E of SW cor. S half NW Sec. 50, Blk. 18, T.&P. Sur. ... Rigged up and shut down.

Cosden-Herbert et al's No. 3 Bickley, 330 ft. N and W of SE cor. of S half NW Sec. 50, Blk. 18 ... Rig.

W. G. Clark et al's No. 1 Collins, 330 ft. S and E of NW cor. Sec. 29, Blk. 18, T.&P.R.R. Sur. ... Location.

W. G. Clark et al's No. 1 Dickenson, W 80 ac. of N 160 ac. of S 320 ac. out of H. B. Williams Sur. No. 272 ... Rig.

P. K. French's No. 1 Lieson, 150 ft. N and E of SW cor. of E half NW Sec. 31, Blk. 14, T.&P.R.R. Sur. ... Shut down 215 ft.

Grisham & Hunter Corp.'s No. 1 Hester, 330 ft. N and E of SW cor. of E half, Lot 12, Kratz Sur. A-247 ... Drlg. 2,345 ft.

Humble Oil & Ref. Co.'s No. 1 Bickley, 330 ft. N and 200 ft. E of SW cor. of N half of S half of SW Sec. 50, Blk. 18, T.&P.R.R. Sur. ... Drlg. 1,750 ft.

Humble Oil & Ref. Co.'s No. 2 Bickley, 330 ft. S and W of NE cor. of SW Sec. 50, Blk. 18, T.&P.R.R. Sur. ... Rig.

McGinley Corp.'s No. 1 Whittemore, 660 ft. N and W of SE cor. SE NE Sec. 39, B.B.B.&C. ... Shut down 1,720 ft.

McNeeley et al's No. 1 Roscoe Bland, 1,175 ft. N and 240 ft. W of SE cor. Subdivision 20, A-164, DeWitt Co. School Land ... Spudded and shut down.

Phillip Pet. Co.'s No. 2 Pomeroy, SW cor. of S 106 ac. SW Sec. 16, Blk. 19, T.&P.R.R. Sur. ... Spudding.

Phillips Pet. Co.'s No. 1 Walters, 990 ft. S and 330 ft. W of NE cor. N 80 ac. of W 160 ac. of NW Sec. 16, Blk. 19, T.&P. Sur. ... Drlg. 700 ft.

Sedgwick O. & G. Co.'s No. 1 Routh, 1,250 ft. N, 2,500 ft. W SE cor. 299-acre tract, Austin & Williams Sur. 355-A-7 ... Drlg. 3,070 ft.

Sedgwick Oil & Gas Co.'s No. 1 Brown, 660 ft. N and 1,320 ft. E of SW cor. Sec. 9, Blk. 1, T.&N.O. Sur.... Location.
The Texas Company's No. 2 Camp, 2,829 ft. N and 323 ft. W of SE cor. Camp 189.5-acre lease, Sec. 13, T.&P. Sur., Blk. 19 ..... Drlg. 2,180 ft.
The Texas Company's No. 3 Camp, 1,189 ft. S and 326 ft. W of NE cor. of Sec. 13, Blk. 19, T.&P. ..... Drlg. 1,005 ft.
The Texas Company's No. 6 Carter, 200 ft. S and W of NE cor. of L. Carter 173.5-ac. tract out of Sec. 13, Blk. 19, T.&P. ..... Drlg. 2,690 ft.
U. L. Tomberlin's No. 1 Horn, 1,980 ft. N and 600 ft. E of SW cor. of 502 ac. of Penney Sur. A-283 ..... Drlg. 260 ft.
E. M. Treat Oil & Gas Co.'s No. 1 Hodge, 750 ft. S and 2,714 ft. W of NE cor. of S half A. Bell Sur. ..... Drlg. 420 ft.
W. D. Wells et al's No. 1 Britton, 150 ft. N and 890 ft. E SW cor. 640-ac. tract, H.&W. Sur. 354-355 ..... Drlg. 740 ft.
White Eagle Oil & Ref. Co.'s No. 1 W. B. Teague, 933 ft. N and W of SE cor. Sec. 30, Austin & Williams Sur. No. 339 ..... Rig.

KIMBLE COUNTY

McLean & Jamison's No. 1 Cannon, 1,940 ft. N and 300 ft. W of SE cor. Robert Cochran Sur. ..... Drlg. 193 ft.

LOVING COUNTY

Lockhart & Co.'s No. 1 Hazell, 2,792 ft. SW of NE line and 660 ft. NW of SE line Sec. 84, Blk. 33, H.&T.C. R.R. Sur. ..... Rigging up standard tools and shut down.
Lockhart & Co.'s No. 2 Hayzell, 330 ft. from NE and SE line of Sec. 84, Blk. 33, H.&T.C.R.R. Sur. ..... Skidding rig.
Lockhart & Co.'s No. 1 Hubbard, 2,640 ft. NE and 660 ft. NW Sec. 84, Blk. 33, H.&T.C.R.R. Sur. ..... Top salt 700 ft.; cem. 8¼-in. casing 2,640 ft.; running 6-in. casing 3,985 ft.
Lockhart & Co.'s No. 2 Hubbard, 1,660 ft. from NE line and 330 ft. from SE line of Sec. 83, Blk. 33, H.&T.C.R.R. ..... Top salt 718 ft.; drlg. 2,292 ft.
Lockhart & Co.'s No. 1 Johnson, 660 ft. S and 1,980 ft. W of NE cor. Sec. 20, Blk. 56, Twp. 1, T.&P.R.R. Sur. ..... Rigging up standard tools.
Lockhart & Co.'s No. 1 Wheat-H, 990 ft. from NE and SE lines Sec. 85, Blk. 33, H.&T.C.R.R. Sur. ..... Top salt 720 ft.; set 8¼-in. casing 2,295 ft.; drlg. 2,365 ft.

MIDLAND COUNTY

Phillips Pet. Corp.'s No. 1 Stokes, 440 ft. S and W of NE cor. S. Beall Sur. No. 101, Blk. 37, Twp. 2s, T.P.R.R. Sur. ..... Shut down 990 ft.

MITCHELL COUNTY

H. H. Adams' No. 1 Elwood, 2,490 ft. E and 1,175 ft. N of SW cor. Sec. 20, Blk. 18, S.P.R.R. Sur. ..... Shut down 528 ft.
The California Co.'s No. 2 Clark Lease No. 2, 2,190 ft. N and E of SW cor. Sec. 14, Blk. 28, Twp. 1n, T.P.R.R. Sur. ..... Drlg. 410 ft.
Ellis and Atlantic O. P. Co.'s No. 1 Elwood, 660 ft. N and E of SW Sec. 30, Blk. 18, S.P.R.R. Sur. ..... Set 8-in. casing 618 ft.; 1,000,000 ft. gas 633-48 ft.
McGinley & Seiger's No. 1 Scott, C of NE of SW Sec. 36, Blk. 17, S.P.R.R. Sur. ..... Shut down 730 ft.
Simms Pet. Co.'s No. 1 Elwood, C SE of Sec. 29, Blk. 18, S.P.R.R. Sur. ..... Underreaming 10-in. casing 1,073 ft.; drlg. 2,713 ft.
Teas & Wheeler's No. 1 Radford, 1,320 ft. N and W of Sec. 1, Blk. 27, T.&P. Sur. ..... Straightening crooked hole 3,965 ft.
Westyde Investment Co.'s No. 1 Elwood, C SW Sec. 38, Blk. 16, S.P.R.R. Sur. ..... Location.

NOLAN COUNTY

L. G. Bradstreet et al's No. 1 Kuteman, C NW Sec. 95, Blk. X, T.&P. Sur. ..... Rig.

PECOS COUNTY

Alexander & Lyle's No. 1 Myrtle Sellman, C SW SE Sec. 20, Blk. Z, T.S.Ry. Sur. ..... Top salt 814 ft.; top lime 1,602 ft.; 3,400,000 ft. gas from 1,611-26 ft.; spraying very little oil; sulphur water 1,652 ft.; shut down 1,655 ft.
Atlantic O. P. Co.'s No. 1 Trees, 330 ft. from N and 990 ft. from W line Sec. 108, Blk. 8, H.&G.N.R.R. Sur. ..... Moving in material.
M. H. Black's No. 1 P.V.O. Co., 2,310 ft. from SE and 1,650 ft from SW lines Sec. 22, Blk. 10, H.&G.N. Sur... Drlg. 1,030 ft.
H. R. Bell et al's No. 1 Gray, 150 ft. from S and 2,490 ft. from W line Sec. 593, G.C.&S.F.R.R. Sur. ..... Drlg. 770 ft.
Buell & Hagan's No. 1 University-B, 330 ft. N and 2,310 ft. W of SE cor. Sec. 36, Blk. 18, University Land ..... Moving in material.
Cowboy Evans' No. 1 Pecos Valley, 2,310 ft. from NW line, 990 ft. from SW line of Sec. 36, Blk. 3, H.&T.C. R.R. Sur. ..... Location.
Crowley's No. 1 Heiner, 2,400 ft. each way from N and E lines Sec. 589, G.C.&S.F.R.R. Sur. ..... Shut down 860 ft.; show oil and gas.
California Co.'s No. 2 Smith, Lease 5. Sec. 16, 1,550 ft. from W and 200 ft. from N line Blk. 194, G.C.&S.F. R.R. Sur. ..... Shut down 1,574 ft.; bailed 22 bbls. 20 hrs.
Ditto Oil Co.'s No. 1 J. M. Montgomery, Sec. 104, Blk. 331, A-16,387 ..... Shut down 660 ft.
Geyer & Frates' No. 1 Smith, 1,320 ft. each way from N and E lines Sec. 8, Blk. 145, T.&St.L.R.R. Sur. ... Drlg. 1,400 ft.
Gulf Prod. Co.'s No. 16 Smith-B, 990 ft. S and 990 ft. E of NW cor. Sec. 22, Blk. 194 G.C.&S.F.R.R. Sur. ..... Drlg. 1,442 ft.
Imperial Oil & Gas Co.'s No. 1 Pecos Valley Oil Co., 990 ft. from SE line and 1,650 ft. from SW line Sec. 22, Blk. 10, H.&G.N.R.R. Sur. ..... Location.
Sam Kitts and others' No. 1 Sherbino, 330 ft. from N and 990 ft. from W line Sec. 52, Blk. C-4, G.C.&S.F. R.R. ..... Rig.
Matador Oil Co.'s No. 3 Smith, 2,310 ft. from N and 990 ft. from E lines, Sec. 24, Blk. 194, G.C.&S.F.R.R. Sur. ..... Moving in machine.
Mauch & Kroger's No. 1 Holmes, Sec. 5, Blk. 178, T.C. Sur. ..... Drlg. 1,405 ft.
McMan Oil & Gas Co.'s No. 5 Smith-C, 2,600 ft. S and 1,740 ft. from W line of Sec. 25, Blk. 194, G.C.&S.F... Shut down 1,599 ft.
Mid-Kansas Oil & Gas Co.'s No. 26 Yates, 1,312 ft. N from most southerly N line, 1,288 ft. E from most westerly E line Sec. 22, Blk. 194, G.C.&S.F.R.R. Sur... Drlg. 600 ft.
Mid-Kansas & Transcontinental's No. 27 Yates-A, 1,296 ft. E and 250 ft. S of NE cor. Sec. 21, Blk. 194, G.C.&S.F. Sur. ..... Drlg. 1,220 ft.
Moncrief et al's No. 1 Tippett, 1,980 ft. from S and 660 ft. from W lines of Sec. 46, Blk. 194, G.C.&S.F. Sur. .. Cellar.
R. E. Moore's No. 1 Arnold, 1,320 ft. from S and 660 ft. from E lines of Sec. 18, Blk. 1, H.&T.C.R.R. ..... Location.
Perrin et al's No. 1 Eaton, 150 ft. each way from NE and NW lines Sec. 27, Blk. 3, H.&T.C. Sur. ..... 18,000,000 ft. gas 1,490-1,502 ft.; spraying salt water from behind 8¼-in. casing set at 1,180 ft.
Phillips Pet. Co.'s No. 1 Courtney, 440 ft. S and E of NW cor. Sec. 78, Blk. OW, T.M.R.R. Sur. ..... Shut down 550 ft.
Phillips Pet. Co.'s No. 2 Ramsey, 990 ft. S and 1,980 ft. W of NE cor. Sec. 17, Blk. 194, G.C.&S.F. Sur. ..... Rig.
Stein & McGee's No. 1 Louis Paterson, 150 ft. SE of NW line, 150 ft. NE of SW Sec. 34, Blk. 16, H.&G.N. .... Drlg. 635 ft.
B. J. Spikes' No. 1 George Brown ..... Shut down 700 ft.
Schumaker et al's No. 1 Williams et al, 330 ft. N of middle of S line Sec. 1, Blk. 117, G.C.&S.F. ..... Shut down 700 ft.
Talbot and others' No. 1 Unsicker, 150 ft. each way from NE and SE cor. line of Sec. 25, Blk. 10, H.&G.N. Sur. ..... Location.
Tidal Oil Co.'s No. 1 University, 1,320 ft. from S and W lines of Sec. 16, Blk. 20, University Land ..... Moving in material.
Transcontinental Oil Co.'s No. 1 Sellman, 990 ft. N and W of SE cor. Sec. 7, Blk. 194, G.C.&S.F.R.R. Sur. .... Drlg. 565 ft.
Transcontinental Oil Co.'s No. 1 University, NE NW SW Sec. 18, Blk. 18 ..... Top lime 1,155 ft.; drlg. 4,307 ft.
Weekley Oil Corp.'s No. 1 Byrne, 990 ft. each way from NW and SW lines of Sec. 24, Blk. 10, H.&G.N.R.R. Sur. ..... Drlg. 255 ft.
World Oil Co.'s No. 1 Kloh, Sec. 47, Blk. 45, Twp. 5, T.P.R.R. Sur., elev. 2,810 ft. ..... Shut down 2,105 ft.

PRESIDIO COUNTY

Phillips Pet. Co., Empire G. & F. Co., Delmar Oil Co. and C E. Miller's No. 1 Tootle Est., C NE Sec. 75, Blk. 3, D.&P.R.R. Sur. ..... Set 8-in. casing 2,365 ft.; shut down.
L. C. Brite's No. 3 Brite, 2,500 ft. N and 2,300 ft. W of SE cor. Sec. 51, Blk. 12, G.H.&S.A. ..... Drlg. 240 ft.

REAGAN COUNTY

Big Lake Oil Co.'s No. 1-C University, 2,598 ft. S and 250 ft. W of NE cor. Sec. 1, Blk. 2, University Land.. Total depth 2,385 ft.; crooked hole.
Kemrow Co.'s No. 1 Sawyer Cattle Co., 1,320 ft. from N and 1,980 ft. from E line Sec. 8, J. G. Robinson Sur. ..... Location.
R. V. Oberholtzer's No. 1 Talley, 1,650 ft. each way from S and W lines Sec. 6, G.C.&S.F.R.R. Sur. ..... Drlg. 2,895 ft.
Skelly Oil Co.'s No. 4 University, 2,310 ft. N and 990 ft. W of SE cor. Sec. 33, Blk. 8 ..... Drlg. 400 ft.

REEVES COUNTY

Exploration Co.'s No. 1 A. A. Kinney, 1,500 ft. W of NE cor. Sec. 26, Blk. C-18, Public School Land, elev. 2,847 ft. ..... Total depth 2,900 ft.; shut down.
Southern Crude O. P. Co.'s No. 1 Kloh-Rumsey, 2,310 ft. N and W SE cor. Sec. 23, Blk. 51 ..... Hole full water 1,140 ft.; drlg. 1,150 ft.
David R. Thompson's No. 1 A. A. Eddins ..... Fishing casing 5,658 ft.; underreaming 8¼-in. casing.
Robert Penn et al's No. 1 Bowles, 2,310 ft. SW of NE cor. Sec. 36, Blk. 50, Twp. 8, T.&P.R.R. Sur. ..... Top salt 1,725 ft.; hole full fluid 5,176 ft.; drlg. 5,193 ft.
Lee O. White et al's No. 1 Kloh-Rumsey, 660 ft. S and E of NW cor. Sec. 5, Blk. 51, Twp. 10, T.&P. Sur. .... Drlg. 160 ft.

RUNNELS COUNTY

Boyce et al's No. 1 E. O. Lange, 2,300 ft. S and 6,900 ft. W of NE cor. Austin & Williams Sur. No. 262 ..... Shut down 1,350 ft.
Foster et al's No. 1 Currie, 1,866 ft. SE of NW line, 335 ft. SW of NE line Gray Carroll Sur. ..... Drlg. 410 ft.
Independent Oil & Gas Co.'s No. 1 Will Rollwitz, 330 ft. S and W of NE cor. S half M. Salinas Sur. No. 20½.. Drlg. 1,565 ft.
Marland Prod. Co.'s No. 1 August Herring, 330 ft. S and 1,650 ft. W of NE cor. Sec. 39, E.T.R.R. Co. Sur... Drlg. 2,730 ft.
McLean et al's No. 1 G. W. Clayton, 150 ft. N line, 270 ft. from W line Sec. 135, E.T.R.R. ..... Shut down 1,185 ft.
Nourse & Tilton's No. 1 R. A. Stokes, 200 ft. S, 600 ft. E of NW cor. G. C.&S.F. Sur. No. 2 ..... Drlg. 3,625 ft.; show oil 3,515 ft.
Pure Oil Co.'s No. 1 Russell, 367 ft. E and 12,231 ft. S of NW cor. Hughes Sur. No. 227 ..... Location.
Pure Oil Co.'s No. 2 Russell, 945 ft. E and 12,015 ft. S of NW cor. Sur. No. 227 ..... Location.
Union Oil Co. of Nevada's No. 1 W. E. Allen, 1,000 ft. N and W of SE cor. Sec. 1, H.E.&W.T. Sur. ..... Shut down 3,850 ft.
Vacuum Oil Co.'s No. 4 McMillan, 555 ft. S and 717 ft. W of NE cor. Lot 22, Domingo Diaz Sur. No. 532 .... Location.

SCHLEICHER COUNTY

J. F. Long and O. C. Long's No. 1 W. H. Williams, NE cor. Sec. 28, H.E.&W.T.R.R. Sur. ..... Shut down 275 ft.

SCURRY COUNTY

I. B. Mims et al's No. 1 J. J. Koonsman, Sec. 216, Blk. 2, H.&T.C. Sur. ..... Spudded and shut down 300 ft.
G. E. Dickman and R. B. Pender et al's No. 1 F. C. Davis, 1,000 ft. N and 1,770 ft. W of SE cor. of Sec. 275, Blk. 2, H.&T.C. Sur. ..... Shut down 2,710 ft.

STERLING COUNTY

F. & G. Oil Co.'s No. 1 W. L. Foster, C SE Sec. 20, Blk. 12, S.P.R.R. Sur. ..... Show oil 1,296-98 ft. and 1,356-58 ft.; fishing 2,182 ft.
George L. Miller's No. 1 Foster, 3,690 ft. S and 1,397 ft. W of NE cor. Sec. 4, Blk. 31, T.&P. Sur. ..... Set 12½-in. casing 830 ft.; set 8-in. casing 2,138 ft.; shut down 2,782 ft.

SUTTON COUNTY

Phillips Pet. Co.'s No. 1 A. G. Holman, 2,310 ft. S and 330 ft. W NE cor. Sec. 25, G.C.S.D.&N.G.R.R. Sur. .... Drlg. 6,365 ft.
L. G. Priest's No. 1 Allison, 1,320 ft. N and E of SW cor. Sec. 52, Blk. A, T.&P. Sur. ..... Set 15-in. casing 530 ft.; drlg. 1,490 ft.
Southern C. O. P. Co.'s No. 1 Allison, 2,310 ft. S and 320 ft. W of NE Sec. 41, Blk. K, G.H.&S.A. Sur. ..... Drlg. 4,130 ft.

TAYLOR COUNTY

V. B. Jameson's No. 1 Webb, 1,170 ft. S and W of NE cor. Sec. 46, Lunatic Asylum Land ..... Drlg. 2,160 ft.
Mid-Continent Oil & Gas Co.'s No. 1 Taylor, 990 ft. W 215 ft. N SE cor. 100-ac. tract, Sec. 18, Guadalupe School Land Sur. ..... 300 ft. oil 2,384-87 ft.; 2,445-50 ft.; swabbed 5 bbls.; shut down 3,006 ft.
Root Drlg. Co.'s No. 1 Martin, 990 ft. E and 1,650 ft. N of SW cor. Sec. 30, Blk. 19, T.&P.R.R. Sur. ..... Drlg. 720 ft.
Wentz Oil Corp.'s No. 1 Armour, 275 ft. N and 330 ft. W of SE cor. W half Sec. 16, Blk. 6, S.P.R.R. Sur. ... Drlg. 2,245 ft.

TERRELL COUNTY

Big-Bend Oil Co.'s No. 1 Barrett, C NW Sec. 155, Blk. D, M.-K.-T.R.R. Sur. ..... Spudded and shut down.
Keck Pecos Trust Co.'s No. 1 Hamilton, C Sec. 6, Blk. D-7, E.L.&R.R. Sur. ..... Shut down 1,749 ft.
Mrs. J. B. McPhee's No. 1 Sam Belt, C Sec. 78, Blk. D-7, E.L.&R.R. Sur. ..... Spudded and shut down.
Milham Exploration Co.'s No. 1 Bassett, Sec. 76, Blk. Y, W. E. Robertson Sur. ..... Cem. 6⅝-in. casing 3,986 ft.; fishing 4,635 ft.
Woodley & Jones' No. 1 Pankenham, C SE NW Sec. 43, Blk. B-2, C.C.S.D.&N.G.R.R. Sur. ..... Shut down 150 ft.

TERRY COUNTY

Kingsland O. & P. Co.'s No. 1 Brownfield, C NW SW SW Sec. 7, Blk. 1-A, E.L.R.R. Sur. ..... Fishing bailer 5,080 ft.

TOM GREEN COUNTY

Fitzgerald & Tallaferro's No. 1 Bennett, C SW Sec. 1,628, E. H. Ringer ..... Shut down 1,920 ft.
Williams et al's No. 1 Willeke, 2,500 ft. N and 75 ft. E of SW cor. Sec. 3, Deaf & Dumb Asylum Land ..... Total depth 750 ft.

UPTON COUNTY

Sun Oil Co.'s No. 1 Long, 2,310 ft. each way from S and W line of Sec. 3, Sur. A-356 ..... Top salt 580 ft.; drlg. 1,150 ft.
Humble O. & R. Co.'s No. 11 Ricker, 1,320 ft. from NE cor. and 5,390 ft. from NW line Sec. 5, Denton Sur. A-127 ..... Drlg. 310 ft.
Wentz Oil Co.'s No. 5 Shirk, 2,310 ft. N and 1,650 ft. W of SE cor. Sec. 35, Blk. 1, M.-K.-T.R.R. Sur. ..... Top salt 815 ft.; total depth 1,890 ft.; fishing.

YOAKUM COUNTY

Weekley Oil Corp.'s No. 1 Knight, C NW Sec. 791, Blk. D, John Gibson Sur. ..... Fishing 1,015 ft.

VAL VERDE COUNTY

Independent Operators' No. 1 Whitehead, SE SE Sec. 30, Blk. 4, I.&G.N. Sur., elev. 1,175 ft. ..... Shut down 4,850 ft.

O. O. Owens' No. 1 Mills, Sec. 128, Blk. 1, I.&G.N. Sur., elev. 2,130 ft. ..... Gas sand 2,491-2,520 ft.; tested 125,750 ft. gas; reset 8-in. 2,511 ft.; shut down 4,210 ft.

Producers Oil Co. et al's No. 1 Everett Bros., 2,310 ft. S and 330 ft. E of NW cor. Sec. 40, Blk. DB, C.C.S.D.&R.G.N.G. Sur. ..... Shut down 2,290 ft.

Dyar Bros et al's No. 1 Wilson, 6,830 ft. N NE cor. Sec. 1, T.&P. Sur., thence 1,680 ft. E Sec. 115, Blk. E, G.C.&S.F. Sur. ..... Shut down 2,715 ft.

Valvert Oil Corp.'s No. 1 Bassett, C NE Sur. 47, Blk. Y .. Set 15½-in. casing 767 ft.; set 10-in. casing 1,510 ft.; shut down 3,600 ft.

WARD COUNTY

Gulf Prod. Co.'s No. 2 Hutchins, NE cor. Sec. 7, Blk. O, G.M.M.B.&A. Sur. ..... Location.

Gulf Prod. Co.'s No. 4 O'Brien et al, C NW SW Sec. 19, Blk. F, G.M.M.&M.A. Sur. ..... Set 15½-in. casing 475 ft.; set 10-in. casing 1,153 ft.; top salt 1,290 ft.; making 1,388 bbls. in 12 hrs. 2,565-2,631 ft.

Gulf Prod. Co.'s No. 5 O'Brien, 330 ft. each way NW of SW Sec. 18, Blk. F, G.M.M.B.&A. Sur. ..... Location.

J.H.L. Oil Co.'s No. 2 Hayzlett, 1,100 ft. from SW and 220 ft. from SE line Sec. 17, Blk. 5, H.&T.C. ..... Averaging 72½ bbls. daily 2,457-2,478 ft.

E. B. Loveiace et al's No. 1 Redman, 1,980 ft. NE of SW line and 1,980 ft. SE of NW line. Sec. 162, Blk. 34, H.&T.C.R.R. ..... Fishing 960 ft.

WINKLER COUNTY

American Maracaibo Co.'s No. 2 Hendricks-B, 1,980 ft. N and 1,650 ft. E of SW cor. Sec. 28, Blk. B-5 ..... Cem. 12½-in. casing 170 ft.; top lime 2,599 ft.; set 8¼-in. casing 2,599 ft.

Atlantic O. P. Co.'s No. 5 Hendricks, 1,320 ft. S and 2,310 ft. W NE cor. Sec. 44, Blk. 26 ..... Running 12½-in. casing 570 ft.; drlg. 2,650 ft.

M. J. Bashara's No. 1 fee, 990 ft. N and 2,310 ft. E of SW cor. Sec. 17, Blk. B-3 ..... Location.

Barnsdall Oil Corp.'s No. 2 Tobe Morton, 1,650 ft. N and 330 ft. E of SW cor. Sec. 26, Blk. B-12 ..... Cem. 8¼-in. 2,758 ft.; top lime 2,751 ft.; cem. 8¼-in. casing 2,758 ft.; set 5-in. casing 2,996 ft.; plugging back to 2,935 ft.; total depth 3,124 ft.

Barnsdall Oil Corp.'s No. 3 Tobe Morton, 990 ft. N and 330 ft. E of SW cor. Sec. 26, Blk. B-12 ..... Cellar.

Empire Gas & Fuel Co.'s No. 1-B Daugherty, 2,310 ft. S and 990 ft. W of NE cor. Sec. 3, Blk. 74 ..... Top lime 2,823 ft.; oil and gas show at 3,165 ft.; drlg. 3,378 ft.; flowing 15,000 bbls. daily; cem. 6⅝-in. casing 3,382 ft.; total depth 3,469 ft.; trying to cement casing.

Humble O. & G. Co.'s No. 1 Hendricks-A, 2,310 ft. S and 330 ft. W of Sec. 48, Blk. 26 ..... Location.

Humble O. & R. Co.'s No. 11 Hendricks-C, Lease No. 2, 1,980 ft. S and 1,325 ft. E of NW cor. Sec. 10, Blk. B-12, Public School Land ..... Cem. 10-in. casing; drlg. 1,874 ft.

Gulf Prod. Co.'s No. 1 Daugherty, 2,310 ft. E and 330 ft. W of Sec. 22, Blk. 26 ..... Location.

Humble O. & R. Co.'s No. 12 Hendricks-C, 1,980 ft. S and 1,325 ft. W Sec. 10, Blk. B-12 ..... Location.

Prairie O. & G. Co.'s No. 2 Daugherty, 330 ft. S and 990 ft. E of NW cor. Sec. 16, Blk. 74 ..... Top lime 2,756 ft.; cem. 8¼-in. casing at 2,759 ft.; drlg. 2,994 ft.; top pay 2,977 ft.; 1,300 ft. oil in hole.

Prairie O. & G. Co.'s No. 1 Scarborough, 990 ft. N and 1,650 ft. W of SE cor. Sec. 1, Blk. C-22 ..... Cem. 12½-in. casing 260 ft.; top salt 1,400 ft.; set 8¼-in. casing 2,845 ft.; drlg. 2,994 ft.

Shell Pet. Co.'s No. 1 Leck, 990 ft. S and 1,650 ft. E of NW cor. Sec. 3, Blk. 74 ..... Cem. 8¼-in. casing 2,796 ft.

Shell Pet. Co.'s No. 5 Scarborough, 330 ft. N and 990 ft. E of SW cor. Sec. 3, Blk. C-22 ..... Top salt 1,110 ft.; drlg. 3,373 ft.

Skelly Oil Co.'s No. 2 Hendricks-C, 1,320 ft. N and 2,310 ft. W of SE cor. Sec. 10, Blk. B-12 ..... Top lime 2,636 ft.; cem. 8¼-in. 2,642 ft.; oil show 2,810-2,970 ft.; 25 bbls. daily, 90 per cent water.

Southern Crude O. P. Co.'s No. 6 Hendricks T-67-3-A, 990 ft. S and 1,650 ft. W of NE cor. Sec. 4, Blk. B-12 ..... Cem. 12½-in. casing 2,245 ft.; cem. 8¼-in. casing 2,664 ft.; top lime 2,612 ft.; drlg. 2,665 ft.

Southern Crude O. P. Co.'s No. 5 Hendricks T-67-F, 330 ft. N and 990 ft. W of SE cor. Sec. 33, Blk. B-5, School Land ..... Top lime 2,711 ft.; cem. 8¼-in. casing 2,784 ft.; top lime 2,711 ft.; drlg. 2,840 ft.; 300 ft. water.

Simms Pet. Co. et al's No. 2 Sealey, 2,434 ft. S and 990 ft. W of NE cor. Sec. 50, G.M.M.&A. Sur. ..... Rotary rig.

Southern Crude O. P. Co.'s No. 8 Hendricks T-88-C, 2,310 ft. S and 1,650 ft. E of NW cor. Sec. 28, Blk. B-5, School Land ..... Top lime 2,515 ft.; cem. 8¼-in. casing 2,535 ft.; drlg. 2,583 ft.

Southern Crude O. P. Co.'s No. 6 Hendricks T-88-K, 2,200 ft. S, 1,650 ft. W of NE cor. Sec. 41, Blk. 26 .... Cem. 8¼-in. casing 2,662 ft.; rigging up standard tools.

Southern Crude O. P. Co.'s No. 7 Hendricks T-88-K, 1,320 ft. S and 1,650 ft. W of NE cor. Sec. 41, Blk. 26 ..... Rig.

Southern Crude O. P. Co.'s No. 32 Hendricks T-88-M, 1,760 ft. S and 990 ft. W of NE cor. Sec. 33, Blk. 26, School Land ..... Drlg. 600 ft.

Southern Crude O. P. Co.'s No. 6 Hendricks T-88-N, 1,320 ft. N and W of SE cor. Sec. 28, Blk. 26, School Land ..... Drlg. 1,195 ft.

Southern Crude O. P. Co.'s No. 7 Hendricks T-88-N, 2,320 ft. N and 2,640 ft. W of SE cor. Sec. 28, Blk. 26.. Running 12½-in. casing 515 ft.; drlg. 990 ft.

Southern Crude O. P. Co.'s No. 3 Hendricks T-88-O, 440 ft. S, 330 ft. W of NE cor. Sec. 28, Blk. 26 ..... Top lime 2,376 ft.; rigging up standard tools.

Southern Crude O. P. Co.'s No. 4 Hendricks T-88-O, 1,320 ft. S and W of NE cor. Sec. 28, Blk. 26 ..... Total depth 300 ft.

Southern Crude O. P. Co.'s No. 2 Hendricks T-88-CX, 2,310 ft. E, 330 ft. S Sec. 21, Blk. 26 ..... Location.

Southern Crude O. P. Co.'s No. 7 Hendricks T-88-H, 2,310 ft. N and 990 ft. E of SW Sec. 28, Blk. B-5, School Land ..... Top lime 2,552 ft.; cem. 8¼-in. casing 2,580 ft.; top pay 2,705 ft.; fishing bit 2,760 ft.; 200 ft. oil in hole.

Southern Crude O. P. Co.'s No. 3 Hendricks T-88-R, 1,320 ft. N and E of SW Sec. 27, Blk. 26 ..... Drlg. 205 ft.

Southern Crude O. P. Co.'s No. 6 Hendricks T-89-J, 2,200 ft. S and 330 ft. W of NE cor. Sec. 9, Blk. B-12.. Top lime 2,510 ft.; cem. 8¼-in. 2,525 ft.; rigging up standard tools.

Southern Crude O. P. Co.'s No. 7 Hendricks T-89-J, 1,540 ft. from N and 1,320 ft. from E lines Sec. 9, Blk. B-12 ..... Cem. 12½-in. casing 371 ft.; drlg. 2,582 ft.

Southern Crude O. P. Co.'s No. 8 Hendricks T-89-J, 440 ft. N and 330 ft. W of SE cor. Sec. 9, Blk. B-12 ..... Drlg. 466 ft.

Texas Canadian Oil Co.'s No. 1 Kloh-Rumsey, 1,320 ft. N and E of SW cor. Sec. 35, Blk. 46, T.&P.R.R. Sur. .. Drlg. 2,945 ft.

PRECISION ATTAINED BY ORIFICE METER

(Continued from Page 48)

established coefficients as determined by the diameter of the orifice and the ratio of orifice to pipe diameters, and thereafter obtained my coefficients for the commercial meters by computation from the data secured by the tests.

Next Serious Problem

With the coefficients once established and the primary meter developed, the next serious problem was to find a way to measure the differential pressure around the orifice. Recording pressure gauges were available for the measurement of the static pressure, but there was at that time no differential pressure gauge available. Mr. Cooper adopted the method of installing a low-pressure diaphragm recording gauge in a spherical cast steel casing, to which the two pressure pipes were connected from the orifice flanges—the upstream pipe leading through a stuffing box into the interior of the casing and connecting to the union on the gauge contained therein, while the downstream pressure pipe simply terminated in a tap in the wall of the casing and applied the downstream gas pressure to the interior, thus immersing the entire gauge—movement, chart, clockwork, pen and all—in an atmosphere of high pressure gas. The indications of the gauge under these conditions gave the difference in pressure on the inside of the gauge movement and that on the outside, which constituted the differential pressure around the orifice itself.

The door of the casing through which the gauge was inserted and which gave access to the chart and clock movement was secured by heavy bolts and was removed every time the chart was changed.

Two Windows Provided

This door contained two glass windows, at one of which a flashlight was held illuminating the gauge on the inside, while the eye was placed at the other in order to note the readings of the gauge and its operation. I, on the other hand, adopted the method of enclosing the gauge diaphragms only, so that they alone would be immersed in an atmosphere of high pressure gas, while their motion was transferred to the pen arm on the outside by means of a small shaft operating through a gastight stuffing box.

The actuating movements of these early gauges were all of the diaphragm type and they proved to be satisfactory as long as excessive differential pressures were not applied. Occasionally, however, a pressure line would clog up or a sudden flow of gas would produce an unusual differential pressure which would blow up the gauge movement, and considerable difficulty was encountered from this source. In order to overcome it, I first applied a mercury seal across the pressure lines, consisting of a U-shaped glass tube of about one-fourth inch bore, filled with mercury, and of such length as to give a mercury column corresponding to the maximum range of the gauge.

This U tube was connected to two reservoirs, one at each end, containing deflectors which were intended to prevent the mercury from blowing out into the piping if the seal were broken.

Bypass Opened

When an excessive pressure was encountered it would blow the column of mercury to one side or the other, thus in effect opening a bypass between the pressure lines and preventing the application of an excessive pressure upon the gauge movement. This device was not satisfactory for several reasons. In the first place, while it protected the gauge if the maximum pressure occurred in the right direction the gauge movement was collapsed if by any chance the excess of pressure came in the opposite direction. Furthermore, it was difficult to secure glass tubing which would stand the strain of the high pressure under which we were measuring gas, and it kept us busy changing the glasses.

In addition to this, the mercury would blow clear out of the trap and get into the lines as well as into the gauge and cause trouble. This led to the development of a trap designed to blow at 100 inches if the maximum pressure occurred in that direction, while if it occurred in the negative direction, the trap would blow at minus 2 inches. This trap was more successful than the first, and the mercury did not get out into the piping when it operated.

Mercury Float Gauge Developed

The great improvement came, however, when the mercury float gauge was developed, which did away with the necessity for the trap.

The next development in the orifice meter came with the use of the pipe tap pressure connections, the coefficents of this meter being established by Hickstein and Fisher about 1913 or 1914, and reported in a paper presented to the American Society of Mechanical Engineers in December, 1915. The secondary devices, that is, the pressure gauges used with this type of meter, are the same, of course, as with the flange connections.

When the orifice meter first came into use, two recording gauges were used, one for the differential pressure and the other for the static, and in some cases the charts of these two gauges were of different sizes in order the more readily to distinguish the one from the other. Later on the two gauges were incorporated in one casing and recorded their pressures on one chart in different colored inks, although a great many meters still employ the two gauges.

Accurate Measurement Range Limited

The range of the orifice meter for accurate measurement is somewhat limited, and one of the earliest efforts to extend this range to provide for a wide variation in flow of gas was to make use of a modification of the orifice. This consisted of an orifice disc with a moveable conical plug so constructed as to be inserted a greater or less distance into the orifice, thus forming an annular space which became narrower and narrower the farther the plug was inserted. The meter thus constructed had eleven positions of the plug, at each of which a coefficient was determined by calibration, giving a range more than eight times as great as a single orifice. This meter was installed at a compressing station and I believe is still in use.

Another development designed to increase the range of the orifice meter is the installation of multiple settings controlled by quick acting valves, each operated from the differential pressure of the preceding meter in the setting. This arrangement finds its principal usefulness in city gate measurements where the demands of the city vary from little or nothing at night to a high rate of flow during the peak hour of the day.

Gas Producers Suspicious

With the development of the orifice meter one of the principal difficulties encountered was to persuade gas producers that the device was a really accurate measuring instrument and was not merely an "invention of the devil" designed to make it a little easier for the gas company to swindle them. It seemed to be too simple for them to comprehend, for they could not see the wheels go 'round and it therefore appeared very mysterious. That feeling is rapidly disappearing, however.

The first work in the development of the orifice meter was done with the idea of producing an instrument accurate to within at least 2 per cent either way. Today gas men are demanding limits even less than 1 per cent and the work of the Gas Measurement Committee of the Natural Gas Department of the American Gas Association, in studying the factors affecting the measurement of gas by orifice meter, indicates that in reality, when properly used, the orifice meter is an instrument of laboratory precision worthy of the highest confidence. It is at once simple in design and comparatively inexpensive, and at the same time is one of the most reliable measuring instruments known today.

PROBLEMS SOLVED IN VAPOR PHASE CRACKING

(Continued from Page 47)

no experimental work was in progress. Gas oil was the charging stock used in all cases.

	60 days Penn. Percent	16 days Sweet Lake	5-days Mexia
430 endpoint distillate	55.67	52.9	52.4
Fuel oil (10°-12°A.P.I.)	16.64	23.4	24.5
Dry gas	30.01	25.3	25.2
Gain	2.32	1.6	2.1

The commercialization of this process of vapor phase cracking has followed rapidly on the heels of the discovery of the causes of the troubles listed above. Briefly, it was found that carbon formation was entirely due to lack of control of the cracking reaction, or to the use of excessive local temperatures. By careful regulation of the time of reaction and by designing the furnace so as to secure efficient heat transfer the formation of carbon was rendered practically nil. Evidence of this fact is found in the reports from units shown in the accompanying photograph which indicate that 30-day runs are fairly common occurrences. After such a run, during which gas oil may be charged at the rate of 1,000 bbls. per day, it is doubtful if 100 pounds of carbon could be collected from all parts of the converter. It does not seem to be too broad a statement to make therefore, to say that carbon or coke formation has definitely been eliminated.

Gas Production

Excessive gas production was found to be partly due to lack of control of the vapor flow in the reaction zone but more often due to failure to regulate the temperature of reaction. It was learned after many expensive lessons that a variation of 5 degrees Fahrenheit in the temperature of the reaction, while maintaining all other conditions constant, would cause a wide fluctuation in the proportion between fixed gas and motor fuel. Changes in the character of the charging stock seem to have much less influence than is the case in liquid phase cracking. Although the actual volume of fixed gas produced is still twice that made by liquid phase cracking, this extra gas is made at the expense of fuel oil production and not by reducing the quantity of motor fuel distillate made.

Heat economies were effected in three ways: 1. The hot flue gases leaving the converter (or cracking section) were led to an economizer built in the form of a pipe still and there used to vaporize the charging stock. In this way stack temperatures were brought down below 550 degrees Fahrenheit. 2. The converter and its furnace were designed so as to utilize to the best advantage the radiant heat from the combustion chamber, and consequently lower the temperature of the flue gases leaving the converter setting. In this way heat transfers of the order of 75,000 B.t.u. per square foot per hour have been effected. This rate should be compared with shell still practice of 20 years ago where a rate of 500 B.t.u. per square foot per hour was considered good. 3. The heat in the vapors leaving the converter was used for rerunning of distillates, stripping of crude oil, generation of steam, or in similar ways, by the design and application of special types of heat exchangers. These economies have cut fuel bills to the point where vapor phase cracking in this respect can now be said to be proceeding pari passu with liquid phase cracking.

Refining Distillate

The problem of refining distillate produced has proved the most difficult, a fact due almost entirely to a lack of knowledge of the subject on the part of the motoring public. Everyone can recall the complaints made in the beginning of the liquid phase cracking development that "this stuff does not smell like straightrun gasoline". The aromatic, rather pleasingly fruity odor of vapor phase cracked motor fuel seems in a similar way to cause motorists concern because it does not smell like present day gasoline. For that matter, neither does a 40 per cent benzol blend. Due to the highly unsaturated character of the hydrocarbons present in this distillate it was not an easy matter to work out a method of removing coloring matter, diolefines and highly reactive olefines without at the same time taking out a large percentage of the desirable compounds possessing high antiknock value. At the present time, however, several methods are available for this purpose, some involving new equipment, others merely adaptations of existing methods. It can now be safely stated that methods are available which will yield at least 95 per cent of satisfactory motor fuel from endpoint vapor phase cracked distillate.

Solving Gum Problem

Any gasoline or motor fuel containing olefines, on standing exposed to the air, forms gum. The rate at which this gum forms is dependent upon the time of such exposure, the concentration of the oxygen in the atmosphere over the liquid, the percentage and kind of olefines in the liquid, the temperature, the amount of agitation given the liquid, and the extent to which actinic light or other catalyzing influences may have access to it. In this paper it is not possible to go into great detail on this important phase of the refining of vapor phase cracked distillate, but certain points require brief treatment.

Since this distillate contains 50 per cent or more of olefines, it is evident that gums should accumulate in it on standing in storage. The olefines cannot be wholly removed by treatment with acid for obvious economical reasons, nor can they be converted into saturated hydrocarbons by hydrogenation without losing the antiknock quality of the product. It has been found, however, that when the product is first produced it is gum free, and while in this condition can be given a certain treatment which inhibits the formation of gum even under rather severe conditions. For example, a sample of vapor phase motor fuel thus treated was blanketed with an atmosphere of pure oxygen in a clear glass bottle and set in a north window. Another sample, not treated, was set beside it. At the end of 35 days the untreated sample showed .0447 grams of gum per 20 c.c. whereas the treated sample contained only .0064 grams per 20 c.c.

It is gratifying to note that refiners generally are alive to the faults of the old copper dish method for determining gum in motor fuels. Altogether aside from the difficulty encountered in getting check determinations it does not give even an indication of the amount of preformed gum present. The copper dish acts as a catalyzer and the large volume of fuel to be evaporated requires such a long time for the test that most of the gum found has been formed during the test. The wide variation in results obtained makes the method of little value even in estimating the stability of a fuel.

An excellent paper on the effect of gum upon engine performance is that of Voorhees and Eisinger of the Standard Oil Co. of Indiana[2]. The authors show very clearly that it is only preformed gum that affects engine performance, a statement borne out by the results of marketing millions of gallons of vapor phase cracked motor fuel during the past three years. They recommend the method of Smith and Cooke[3] for the determination of preformed gum, in which 20 c.c. are evaporated from a 30 c.c. pyrex dish of special shape in an atmosphere of steam. With very slight modifications this method has been in use for nearly three years in half a dozen laboratories widely separated, and so far appears to be giving very satisfactory results. A satisfactory method for determining potential gum has not yet been found.

Characteristics of Gasoline

The characteristics of the products produced by vapor phase cracking are worthy of more attention than can be given them here. The motor fuel produced contains no more than traces of paraffins, and these are all under the hexanes in size. When analyzed by the method of Egloff and Morrell it shows 45 to 50 per cent olefines, 40 to 45 per cent aromatics and the balance naphthenes, with paraffins wholly absent. It is known that the dry gas contains less than 0.5 per cent of butane and isobutane, hence it seems reasonable to expect only very small quantities of the higher paraffins to be present in motor fuel. The A.P.I. gravity of the motor fuel made from a Pennsylvania gas oil runs about 54 to 55 degrees or some 8 degrees lower than the straightrun product of the same distillation range. While changing the charging stock has some effect upon the character of the motor fuel, yet this influence is much less marked than in the case of liquid phase cracking.

When the operation is such as to produce the maximum quantity of distillate the finished motor fuel, apparently without regard to the character of the charging stock, has a uniformly high antiknock value. It should be pointed out that no automobile engines on the market today have a high enough compression ratio to warrant the use of a fuel having an antiknock rating higher than 40 to 45 per cent of benzol. By blending equal volumes of straightrun gasoline and vapor phase cracked motor fuel there is produced a fuel having an antiknock rating of 40 to 45 per cent benzol. Expressed in other words, vapor phase cracked motor fuel has a blending value of 80 to 90 per cent of the value of motor benzol. Thousands of tests on a laboratory engine and dozens of demonstrations with 4, 6, and 8-cylinder automobiles have demonstrated this statement beyond question.

The distillation range of the finished motor fuel is somewhat different than ordinary gasoline, being richer in the lower boiling fractions. This makes it unnecessary to add natural gas gasoline, as must usually be done with liquid phase cracked fuel, and therefore increases its value as a blending agent. Partly due to this greater volatility, but largely because of its aromatic character, vapor phase cracked motor fuel has a lower viscosity than ordinary gasoline. Its freezing point is considerably below minus 100 degrees Fahrenheit, a point of considerable value in making an aviation fuel. A very remarkable fact, especially in view of the importance of West Texas and Venezuela production, is the relatively low sulphur content of vapor phase cracked distillate.

Two examples may be cited here; in one a light recycle stock from a liquid phase cracking operation was charged to a vapor phase installation. Although this recycle stock contained 0.80 per cent sulphur, the vapor phase cracked distillate carried only 0.13 per cent sulphur. In the other instance a Mexican gas oil containing 1.20 per cent sulphur was cracked in the vapor phase and there was found in the distillate 0.23 per cent sulphur. From these facts it would appear that marketable motor fuel may be made from high sulphur crudes more easily by vapor phase cracking than can be done with liquid phase equipment. The gas, of course, is correspondingly richer in hydrogen sulphide, since the sulphur seems to be split off in this form.

Fuel Oil Properties

The fuel oil produced varies somewhat, depending upon the character of the charging stock and the nature of the nonvaporizable constituents in it. The following tests on Gyro fuel oil are taken from operating reports of the plants of the Pure Oil Co.

Kind of charge—	Corning gas oil	Pennsylvania gas oil	Mexia gas oil	Topped M.C. crude	Sweet Lake crude
Gravity, °A.P.I.	11.3	12.7	11.9	15.5	12.2
Flash, °F.	325	335	270	370	295
Vis./122. Furol	189	81	63	158	79
Pour	15	5	0	35	0
B.s.&w.	0.5	0.3	0.2	0.35	0.4

Fixed Gases

The fixed gas produced after removal of the motor fuel content has a specific gravity of about 1.0 and a fuel value of approximately 1,700 B.t.u. per cubic foot. Its composition varies little except for the H_2S content, which depends upon the sulphur content of the charging stock. The average analysis of the gas from Pennsylvania gas oil is as follows:

	Per cent
CO_2+H_2S	6.25
CO	0.15
H_2	7.00
C_2H_4	27.00
C_3H_6	16.00
C_4H_8	9.00
C_4H_6	1.00
Saturated hydrocarbons	39.60

It can readily be seen that this gas has excellent possibilities in the field of gas manufacture where it can be substituted for "oil gas" as an enriching agent. Plants not immediately in the vicinity of a water gas or producer gas plant could very easily liquefy the propylene-butylene fraction and ship it by tank car for such purposes, utilizing the residues for plant fuel.

Perhaps the most inviting possibilities for this gas lie in the field of chemical manufacture. One large chemical concern is already using huge quantities of it for its ethylene content. The uses for ethylene are many, and indications point to a steadily increasing demand. To list only a few of the products that may be made from this ethylene we have; acetic acid, ethyl alcohol, ethylene dichloride, ethylene glycol, pure ethylene for anaesthesia, and mustard gas, known during the war as yperite. Propylene which can be recovered here in a state of high purity can be used as a refrigerant, or may be used in the preparation of isopropyl alcohol, isopropyl acetate, acetone, and propylene glycol.

It is not known as yet in what proportions the three butenes are found, though all are present. This fraction may be used in the preparation of isobutyl and tertiary butyl alcohols, butyl acetates for cellulose acetate solvent, and methyl ethyl ketone. It is understood that some effort has been made to use the butadione in making synthetic rubber, but the concentration is rather low for this purpose. It is possible that its synthesis through the isopropyl alcohol fraction might be feasible in case rubber prices became high enough. At present, however, that possibility seems remote.

The vast quantities of raw materials which will be made available for chemical synthesis in this manner may be realized when present production is considered. At present from a daily throughput of 4,000 bbls. of gas oil nearly 5,000,000 cubic feet of dry gas are being produced. This means 1,350,000 cubic feet of ethylene, 800,000 cubic feet of propylene and 450,000 cubic feet of the three butenes. A third use for this gas, which bids fair to consume the major portion of its unsaturated hydrocarbon content is in the synthesis of motor fuel. Some preliminary experiments along this line indicate that a very highly antiknock product especially suited for aviation motor fuel can be made from it in large quantities at low cost. It is hoped that a more detailed report on this feature will be available later.

In conclusion it is interesting to list a few of the salient features of the Gyro process, which distinguish it in the field of motor fuel manufacture.

1. High antiknock value of motor fuel produced.
2. Freedom from carbon formation with resultant long-time runs and practically continuous operation.
3. Safety and ease of operation due to low pressure employed and ability to utilize automatic control.
4. Ability to handle any grade of crude oil or other charging stock.
5. Yields of motor fuel equal to those produced by other cracking processes.
6. Value of fixed gas for enrichment, for chemical manufacture, and for hydrocarbon synthesis.
7. Low operating labor and maintenance costs.
8. Desulphurizing character of reaction.

[2]The Importance and Significance of Gum in Gasoline, by V. Voorhees and J. O. Eisinger, read before the Ninth Annual Meeting of the American Petroleum Institute at Chicago, December 7, 1928.

[3]Bureau of Mines Report, Serial No. 2,394 (1922). Bureau of Mines Report, Serial No. 2,686 (1925).

I.T.I.O. WELL'S PAY HORIZON IS A PUZZLE

(Continued from Page 47)

ples, but those taken, together with one standard tool core, revealed the nature of the producing formation. They were essentially the same as those in the section drilled above the point of standardization. They were drab to light gray dolomite with a texture varying from dense to sucrose and including many minute vugs or cavities and fissures ranging in size from miscroscopic to the size of lead in a pencil. Very thin streaks of white chert and fine sand occurred sparingly throughout. The porosity is effected by the minute fissures and vugs and intercrystalline space where the dolomite becomes sucrose instead of dense.

Section Out of Proportion

A 300-foot section of the dolomite phase of the Simpson would be quite out of proportion with the correlative thickness drilled in the Cromwell's No. 1 Thompson in Section 15-12-3w but a few miles north. It is well known that this part of the Simpson does vary in thickness but, in view of the fact that some of the dolomite in the I. T. I. O. test must have been eroded since the Pennsylvanian rested directly on it, such a variation would be highly improbable in this part of Oklahoma. This part of the Simpson also carries microfossils and shell fragments in almost every occurrence, but here too these may have been erased by recrystallization. However, the preponderance of evidence is regarded as against the Simpson.

This well is located on one of the largest surface structures in the state, and principally for that reason it was thought that the productive area would be large. Many think now that the deep sand pay is the siliceous lime. The history of this formation has been that it covers only a limited area, but it is pointed out that this district may prove an exception to the rule. If this theory is correct it will require a considerable number of wells to be drilled before some of the smaller structures are uncovered.

Few Shallow Sand Producers

Another interesting development of the region is the failure of the shallow sands to produce with the exception of a few that have been completed as gas wells in the last few weeks. When the discovery well was being drilled, the core barrel revealed three good showings of oil and gas. The first at 2,800 feet, the second at 3,950 feet, and the third at 4,900 feet. It was believed at the time of drilling this well that the company could have made a good producer of it in any of these horizons.

When the other wells in the pool were started, and most of them found to be failures in the shallow sands there was much disappointment as the shallow sands had been expected to furnish enough production to pay the cost of the wells in the event that the deep pay was dry. One exception was the Indian Territory Illuminating Oil Co.'s No. 1 Trosper Park, Section 13-11-3w. The well cored sand at 3,987-91 feet and it was estimated at the time that the well would produce from 300 to 400 bbls. of oil a day.

Production of the well at the time it was completed was 5,800 bbls. daily. During the next four months is had dropped down to 2,090 bbls. and also began to make water. It then increased the oil production to 4,100 bbls. and the water also increased. Since the first showing of water the well has steadily declined its oil production and increased its water production. This condition has been characteristic of all other Arbuckle or Siliceous lime pools that have been found in Oklahoma up to this time.

Remaining Possibility

The remaining possibility is the dolomite of the Arbuckle group known to the industry as the Siliceous lime. In most sections drilled it is not limestone but dolomite and in many it is not Siliceous but drills like sand. If the formation in question is Arbuckle intense structural relief must be assumed, for the Hunton lime, Sylvan shale, Viola limestone and Simpson have been cut out between the I. T. I. O. discovery well and the Cromwell test in Section 15-12-3w. Otherwise the lithology, absence of fossils and porosity strongly suggest Arbuckle or Siliceous lime. The structural relief at Garber is comparable to the 1,000 feet or more which must be present at Oklahoma City if the producing formation is Arbuckle (Siliceous lime.)

The thickness of the formation exceeds that expected of possible parts of either the Hunton or Simpson groups. The lithology can be duplicated or approximately so in the Henryhouse formation of the Hunton, the upper part of the Simpson or many parts of the Arbuckle (Siliceous lime.) The absence of fossils strongly suggests Arbuckle, which is notoriously sparse in fossils in well cuttings, while the Hunton and Simpson both carry them. The Pennsylvanian might rest on either of the three possibilities depending on the structural relief of the area, but normally overlying the Hunton. The size of the surface structure suggests intense structural relief, with depth, if Garber may be used in comparison.

UNIQUE METHODS OF TREATING EMULSIONS

(Continued from Page 45)

and the oil overflow there will be standing in the tank when in operation approximately 10 inches of oil on top of the water.

The capacity of separating tanks of this kind to handle fluid properly depends upon many variables among which are the character of the oil, the water, and the emulsions. Probably the maximum capacity noted in the Tonkawa Field has been 9,000 bbls. per 24 hours, of which 3,000 bbls. was water. The oil entered the tank containing from 5 to 7 per cent emulsion and went to the stock tanks with less than 0.5 per cent emulsion. A small proportion of the bottom settlings had to be treated separately.

It should not be inferred that all emulsions can be so easily and cheaply treated. In the Tonkawa Field it is customary to use 1 quart of reagent to every 40 or 50 bbls. of tank bottoms that are treated in this kind of tank. The reagent is either injected into the lead lines or is allowed to drip from a slow leak in a can placed over the top of a flume. With bad emulsions formed from heavy crudes it is customary to apply heat on the lead lines or to the fluid in the tank by means of a thermosiphon.

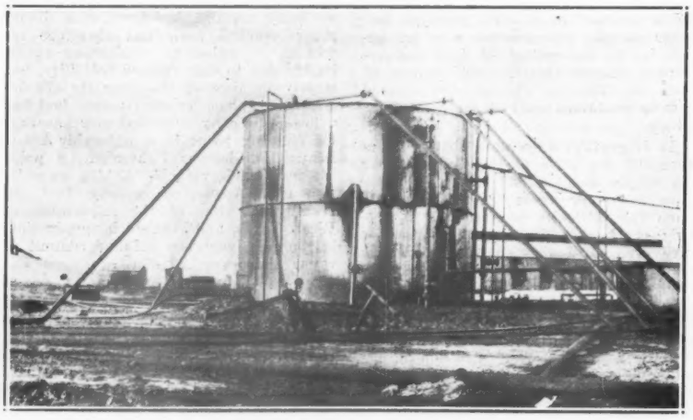

Figure 2.—Photograph of a separating tank for treating emulsions on the Beverlin lease, Tonkawa Field, Section 34-25n-1w, Oklahoma.

WEST TEXAS FIELDS

(Continued from Page 54)

remainder of the line is not expected to be completed before the middle of July.

Proration Meetings

Two proration meetings are scheduled to be held next week. The first will probably be April 30 when the Yates Pool operators are scheduled to meet to consider the application of Mid-Continent Oil & Gas Co. for an increase of 12,500 bbls. in Yates. The other meeting is scheduled for May 3 when the Railroad Commission will hold an open hearing to determine the desirability of extending the Hendricks plan six months.

The Hendricks plan expires May 5. Operators representing more than 95 per cent of the potential production of Winkler County have signified their intention of voting for a continuation of the Hendricks plan. The advisory committee has worked out a new method of rating the potential of wells in Hendricks showing water. A field committee comprised of lease and production superintendents will determine the percentage of cuts in potential when operators do not desire to open a well showing water. Opening such wells for proration gauge has proven detrimental in the past.

Production Report

Production of West Texas for the past week remained almost the same as the week before when a big drop was reported. Only a small gain was reported and this was due more to the increase resulting from gauging wells for proration purposes.

Estimated Daily Average Production
WEST TEXAS
Week Ending April 20

County—	Wells	Prodn.
Crane County	281	35,120
Crockett County	46	2,131
Ector County	2	0
Fisher County	7	925
Glasscock County	18	752
Howard County	299	42,392
Jones County	82	5,160
Loving County	10	526
Mitchell County	143	2,617
Pecos County	302	87,649
Reagan County	241	18,402
Runnels County	2	78
Scurry County	5	31
Upton County	268	13,269
Ward County	4	555
Winkler County	581	145,110
Total this week	2,292	354,817
Total last week	2,277	354,077
Difference	15	740

WEST TEXAS COMPLETIONS
Week ending April 20
Concho County

Duffey & Silk's No. 1 Lovelace and Lockett, located 1,050 feet north and 640 feet west of SE cor., Section 66, Block 70, H.&T.C.R.R. Survey, was dry and abandoned at 1,824 feet. Exploration Co.'s No. 2 Hartgrove, located 900 feet from south and 985 feet east of NW cor. Johann Scheuch Survey No. 240, rig was abandoned.

Howard County

Comet Oil Co.'s No. 3 Clay, located 200 feet south and east of NW cor., Section 154, Block 29, W.&N.W.R.R. Survey, was shot with 40 quarts at 1,804-25 feet and made a 60-bbl. well. Amerada Petroleum Corp.'s No. 7 Dora Roberts, located 330 feet south and 2,310 feet west of NE cor., Section 137, Block 29, W.&N.W. R.R. Survey, made 350 bbls. at 2,926-47 feet. Its No. 8 Dora Roberts, located 1,116 feet north and 1,022 feet west of SE cor., Section 29, made 144 bbls. at 1,302-20 feet. Cosden & Co.'s No. 3 Dora Roberts-C, located 1,520 feet north and 600 feet west of SE cor., Section 128, Block 29, W.&N.W.R.R. Survey, made 360 bbls. at 1,267-1,339 feet. Group One and Marland Oil Co.'s No. 7 Settles, located 330 feet south and east of NW cor. Section 133, Block 29, W.&N.W.R.R. Survey, made 800 bbls. at 2,184-2,240 feet. Marland Oil Co.'s No. 3 Clay-H located 330 feet south and west of NE cor., Section 155, Block 29, was shot with 30 quarts at 1,817-28 feet and made 60 bbls. after which it was drilled to a total depth of 1,830 feet. Merrick-Bristow Oil Co.'s No. 8 Dora Roberts, located 990 feet north and 330 feet east of SW cor., Section 137, Block 29, W.&N.W. R.R. Survey, made 1,476 bbls. at 2,954-73 feet. Moody Oil Corp.'s No. 10 Dora Roberts-E, made 225 bbls. at 2,329-2,648 feet. Schermerhorn Oil Co.'s No. 5 Roberts-A, located 1,650 feet south and 2,250 feet west of NE cor., Section 137, Block 29, made 200 bbls. after having been shot with 160 quarts at 2,470-2,612 feet. Witherspoon and others' No. 2 Kloh-Rumsey, located 280 feet north and 3,315 feet east of SW cor., Section 32, Township 2s, T.&P.R.R. Survey, was shot with 300 quarts at 2,220-2,318 feet and made 830 bbls.

Mitchell County

Magnolia Petroleum Corp.'s No. 6 Mary Foster located 1,980 feet north and east of SW cor., Section 17, Block 29, Township 1s, T.&P.R.R. Survey made 106 bbls. at 2,735-2,875 feet.

Runnels County

Hamilton and others' No. 1 Spill, located 1,320 feet south and west of NE cor. A. Spill 891 acres out of T. R. Webb Survey 358, was temporarily abandoned at 100 feet. Summers and others' No. 1 Reese located in M. J. Parramore Survey 26, was temporarily abandoned at 1,655 feet. Miles Oil Co.'s No. 1 Lawhorn was dry and abandoned at 2,449 feet.

Winkler County

Prairie Oil & Gas Co.'s No. 1 Leck, 2,310 feet east, 330 north of Section 16, Block 74, topped the lime at 2,652 feet, topped the pay at 3,069 feet, was drilled to a total depth of 3,124 feet and had an initial production of 92 bbls. hourly. Southern Crude Oil Purchasing Co.'s No. 2 Hendricks T-89-F, located 2,310 feet south and east of Section 40, Block B-5, topped the lime at 2,330 feet, topped the pay at 2,536 feet, was shot with 175 quarts at 2,500-2,700 feet and had an initial production of 150 bbls. daily. Southern Crude Oil Purchasing Co.'s No. 2 Hendricks T-89-H, located 330 feet east and 2,310 feet south of Section 46, Block 26, topped the lime at 2,298 feet, was shot with 320 quarts at 2,810-2,970 feet and had an initial production of 75 bbls. oil daily and 20,000,000 feet of gas.

INVENTION TO SHOW HOLE'S DEVIATION

(Continued from Page 44)

with the plate for the mounting of a rewind mechanism.

Secured in an opening in the inturned arm at the lower end of the plate is a pivot stud protruding downwardly and having a tapered end co-operating with the pivot stud at the upper end for pivotally supporting the recording unit in the housing.

The rewind mechanism includes a spool mounted on a shaft for carrying a blank record strip. The shaft is placed above the lower inturned arm sufficiently to allow operating clearance for the revolving spool. The ends of the shaft are fixed in horizontally aligning openings at one side edge of the plate and the bracket.

Spaced upwardly from the spool and mounted for rotation in openings at the opposite side of the plate and the bracket is a shaft fitted with a rewind spool and worm gear. This worm gear is fixed on the shaft with one side against the plate and its opposite side face in a vertical plane with the inner face of the flange of the spool. The rewind spool is secured on the shaft between the worm gear and the bracket and is provided with side flanges. The face of the outer flange is in a vertical plane with the inner face of the flange on the spool.

Rollers Mounted on Pins

At the side edges of the plate and about midway between the rewind spool and the upper inturned arm of the support frame is a pair of idler rollers mounted on pins fixed in the plate and

extending inwardly and parallel with the rewind spool shaft.

The record strip, which is like the familiar roll of paper on an adding machine, extends upwardly from the spool and over the idler rollers to present a horizontal portion for co-operation with an inking device. The part of the strip extending downwardly from the rollers is connected with the rewind spool.

Mounted on the plate in the space between the rewind spool and the idler rollers is a spring motor with a worm screw engaged with the worm gear. This revolves the spool clockwise, thus rewinding the record strip. The motor is provided with the usual speed regulating screw by which the rate of travel of the record strip may be controlled.

It will be noted that the weight of the parts mounted on the plate at one side of the axis of the frame will be greater on the corresponding side of the axis and will cause the recording unit automatically to swing on its pivots so that the weighted side of the unit will assume the lower position when the device is inclined.

Inking Device

The inking device co-operating with the record strip includes a pear-shaped pendulum attached by a string to an eyelet screw in the upper inturned arm of the frame centrally between the idler rollers and in vertical alignment with the cipher indication line on the record strip. In the lower end of the pendulum is an opening engaged by an inking pen resting on the horizontally extended portion of the record strip.

Should the drill bit be deflected by a slanting rock formation the inclination of the device in the drill pipe will cause the recording unit to swivel on its pivots in the housing so that the weighted side of the unit will come to rest at the lower side of the inclination when the rotation of the bit is stopped. With the device held in an inclined position the pendulum swings inwardly toward the plate to assume a vertical position and the pen moves outwardly from the pendulum to maintain its contact with the record strip.

As the inclinometer is retained momentarily in an inclined stationary position and with the recording parts in a corresponding relative position, the rewinding of the strip by the motor-driven rewind spool causes the strip to move under the pen, whereupon the ink from the pen produces a line on the strip corresponding to the indication lines, from which varying angles of deviation from vertical may be determined when the device is raised to the surface for examination.

WEST TEXAS SUPPLY AND DEMAND BALANCE

(Continued from Page 45)

that since the majority of operators desire Yates production held to its present level for the present that the request for additional oil will be withdrawn.

May Extend Hendricks Plan

The Winkler County proration plan expires May 5 and although Hendricks is believed to be on the toboggan, operators representing 96 per cent of the potential production of the Pool have approved of the request to extend the plan six months more, according to L. E. Barrows, chairman of the advisory committee. The Railroad Commission designated May 1 as the date for an open hearing on the matter. The commission heretofore has always followed the recommendations of its advisory committee and in all probability the proration term will be extended to November 5.

Almost every West Texas wildcat constitutes a threat to conditions in the Permian Basin area, but at the present time none of the areas on which wildcat production has been found shapes itself into a menace. This leaves West Texas for the first time in months in the healthy condition of having supply and demand in equilibrium and with nothing big on the horizon open to competitive drilling.

The most promising wildcat producer is Gulf Production Co.'s No. 4 O'Brien in Ward County near Wickett and a few miles south of the Winkler County line. This well made 1,388 bbls. in 12 hours on a test from a total depth of 2,631 feet. Anyway the pool goes it appears that the Gulf company will control the bulk of the producing acreage and this area is not expected to be the scene of an accelerated drilling campaign unless production is discovered on the university leases to the southwest.

Chairman Gilmore's View

Although the Railroad Commission of Texas has sanctioned proration in West Texas, it will not take any action which might infringe on antitrust laws, Clarence Gilmore, chairman, declared. He said that in its restriction measures the Railroad Commission has refused to take any action based on economic and physical production, but that its prorating has been for the purpose of preventing waste.

"The American Petroleum Institute proposals were based on economic and physical grounds and resulted from a desire to prevent the production of more oil than the world could consume," Mr. Gilmore said. "The Railroad Commission proration program in certain Texas fields is concerned only with the prevention of waste.

"We have been informed that the ultimate result of proration in the Winkler County Field will be the recovery of from 40 to 100 per cent more oil than would have occurred without proration," Mr. Gilmore said.

PANHANDLE FIELDS

(Continued from Page 53)

Davis was drilled to a total depth of 641 feet and dry and abandoned. Sheldon and others' No. 1 Eiland was dry and abandoned at 928 feet. Anderson's No. 1 Leatherwood was shot with 20 quarts at 1,150-64 feet and had an initial production of 25 bbls. Butler and others' No. 1 Shield-Maddox location was abandoned. Campbell and others' No. 1 Sweet was dry and abandoned at 1,146 feet. Cross Cut Corp.'s No. 1 Newton was drilled to a total depth of 1,163 feet, shot with 15 quarts at 1,146-51 feet and had an initial production of 6 bbls. on pump.

Coleman County

Barbee-Ross' No. 1 Farmer was temporarily abandoned at 1,750 feet. Kirk and others' No. 1 Coursey was temporarily abandoned at 970 feet. Tower & McKenna's No. 1 Holmes was dry and abandoned at 2,505 feet. Eppler and others' No. 1 Sampson location was abandoned. Rex-Tex and Pytex Oil Co.'s No. 1 Boker had an initial production of 10 bbls. oil flowing through tubing and 1,700,000 feet of gas at 1,372-74½ feet.

Callahan County

Bremen and others' No. 1 Hobbs was dry and abandoned at 1,227 feet. Reiter & Foster's No. 1 Finley was dry and abandoned at 1,050 feet.

Eastland County

Free's No. 1 Lauderdale was dry and abandoned at 750 feet.

Erath County

Nelson Oil Syndicate's No. 1 Finch was dry and abandoned at 3,877 feet.

Palo Pinto County

Conway Brothers' No. 1 Hickson was shot with 220 quarts at 3,343-3,418 feet and had an initial production of 250,000 feet of gas.

Shackelford County

Croon and others' No. 1 Huskey was dry and abandoned at 2,005 feet. Humphreys Brothers, Inc.'s No. 1 Flippin was dry and abandoned at 1,050 feet. Ohio-Texas Oil Co.'s No. 2 Matthews-C was drilled to a total depth of 1,102 feet and had an initial production of 120 bbls.

PANHANDLE COMPLETIONS

Gray County

Empire Gas & Fuel Co.'s No. 1 Clay,

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They're Both CANTILEVER
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located NE cor., Section 135, Block B-2, was drilled to a total depth of 3,364 feet, shot with 120 quarts at 3,135-69 feet and pumped 25 bbls. daily.

Hutchinson County

Dunnigan and others' No. 1 O. W. Luginbyhl was drilled to a total depth of 3,232 feet, shot with 60 quarts at 3,-110-40 feet and made 20 bbls.

Motley County

Exploration Co.'s No. 1 Tillson was drilled to a total depth of 4,003 feet and dry and abandoned.

Moore County

McMan Oil & Gas Co.'s No. 2 Sneed, located 2,260 feet south and 990 feet west of NW cor. of Proctor Survey, is swabbing 125 bbls. daily at 3,157-3,163 feet. Phillips Petroleum Co.'s No. 4 Sneed is swabbing 180 bbls. per day from 3,142-45 feet and 3,151-53 feet.

Wheeler County

Fain-McGaha and Humble's No. 1 Noel, 330 feet each way from NE cor. S half SE, Section 54, Block 24, H.&G.N.R.R. Survey, was dry and abandoned at 2,876 feet. Johnson & Co.'s No. 1 Purcell, 430 feet from north line and 570 feet from west line, NE Section 50, Block 17, H. &G.N.R.R. Survey, made 6,000,000 feet of gas at 1,735-90 feet and 1,885-90 feet.

REDUCE KEROSENE PRICES IN OKLAHOMA

(Continued from Page 42)

not been anxious to buy at the 8-cent price, the 5,000,000-gallon purchases previously mentioned being placed under that figure.

The result of this situation is obvious. The refiner has the choice of selling his high gravity gasoline at less than its relative value based on the domestic market or he can throw his entire gasoline yield into U. S. Motor gasoline. The latter policy means that the domestic market will be compelled to absorb all the increased output of Mid-Continent refineries, a development which in a short time would threaten the stability of that market regardless of how firmly established it may be at the present time.

With this condition in mind there are those in the trade who take the position that the export market will to a large extent control the domestic market in the Mid-Continent although it represents only a small fraction of the total shipments. An effort is being made at this time to organize the Mid-Continent refiners so that they can become affiliated with the parent organization. If this plan is carried out the Mid-Continent refiners will be guaranteed their share of the export business over the remainder of the year. This share is based on the quantity exported by Mid-Continent refiners last year, plus their share of any increased business. This arrangement assures an export outlet for the Mid-Continent but does not alter the price situation previously mentioned.

Gasoline and Naphthas

Refiners reported a steady demand from the jobbing trade of the Middle West at the 7½-cent U. S. Motor price. Practically no material was available under that price with 7⅜ cents the resale price. West Texas refiners are not cutting prices and this had aided the Oklahoma market.

The high gravity domestic movement is slow. Warmer weather has brought a decline in the demand from the northern states and Canada. The same situation applies to the high gravity blends. In Oklahoma the low on the 60-62 400 grade for domestic movement was 7¾ cents and 8 cents for 375. Prices ranged one-half cent above these quotations.

Kerosene and Distillates

North Texas kerosene prices to a large extent established the Oklahoma market. Buyers were able to secure the 41-43 water white grade at 6¼ cents North Texas, which is the equivalent of 6⅜ cents Oklahoma.

Oklahoma refiners were slow in meeting these prices and on Tuesday the 41-43 water white grade was still generally quoted at 6½ cents. The spot demand was slow, the movement being confined to orders placed earlier in the month and the regular contract movement. Offers for May business pointed to still lower prices.

Several Oklahoma refiners have withdrawn from the furnace oil market. They have increased their kerosene yields and are using the remainder as charging stock or gas oil. Prices are one-fourth cent lower than last week.

Fuel Oil and Gas Oil

Oklahoma refiners desirous of selling fuel oil and gas oil in the Middle West are encountering low prices from West Texas refiners. The latter refiners, with low priced crude oil and heavy yields of fuel oil and gas oil, have substantial quantities to offer. The sulphur content is high but this is not proving objectionable to most of the buyers. Sales of West Texas gas oil on a Group 3 basis of 2¼ cents were reported during the past week.

Natural Gasolines

The natural gasoline demand was slow the first of the week. The A and AA grades were fairly steady at 8 cents, although an occasional sale of 7⅞ cents was reported in Oklahoma. The BB and B grades were weaker and were bringing 7⅝ to 7¾ cents. The C grade was quoted at 7⅜ to 7½ cents.

Lubricants and Wax

Although 600 steam refined stock in Pennsylvania has been advanced to 30 cents with 50 cents the prevailing market for Pennsylvania bright stock, no general advances in Oklahoma materialized. The best grades in Oklahoma are the strongest. The wax buying is confined to small domestic purchases at prices around 3¼ cents for 124-126 material.

Late Fields

(Continued from Page 52)

duction and gaining in water production.

The Sunday shut-down plan reduced the production in Seminole area 68,761 bbls. over the past week end. Nine companies observed the plan this week compared to 13 last week. The following table shows the production for two days by companies:

Company—	April 20	April 21
Atlantic	1,544	165
Barnsdall	15,759	4,422
Continental	2,400	700
Magnolia	35,811	23,441
Mid-Continent	8,598	6,068
Prairie	49,624	17,571
Producers & Refiners	1,325	1,280
Shell	6,365	2,017
Tidal	7,458	4,459
Total	128,884	60,123

In the Maud Pool proper, W. B. Pine's No. 1 Smith, SW NE Section 8-8-5, Pottawatomie County, is a Misener sand well. It flowed 300 bbls. in 11 hours from sand at 3,979-4,010 feet.

The production of the Greater Seminole Pool as of April 22 follows:

	April 21	April 22
Little River	61,866	73,292
Carr City	11,428	14,260
Maud	15,513	15,484
Mission	28,371	30,029
Bowlegs	24,856	34,483
Earlsboro	47,643	61,981
Seminole City	25,752	33,830
Searight	8,056	12,652
St. Louis	106,204	97,246
Total	329,689	373,257

Magnolia Petroleum Corp.'s No. 1 fee, SW cor. NW NE, Section 11-8-5, Carr City Pool, Pottawatomie County, is a failure in the Wilcox sand having encountered water at 4,387-95 feet.

Magnolia Petroleum Corp.'s No. 1 Hurst, SW cor. SE SE, Section 24-8-5, which is a semiwildcat south of the Mission Pool, is also a failure in the Wilcox sand at 4,535-46 feet and will be abandoned.

Independent Oil & Gas Co.'s No. 1 Little, SW NW NE, Section 26-7-6, Seminole County, is one of the largest gas wells so far completed in the south Little River Pool. The Gilcrease sand was at 3,146-73 with a volume of 45,000,000 feet of gas.

McGraw Oil Co., Irwin & Martin and others' No. 1 Kelly, SE cor. NE NE, Section 2-7-4, Pottawatomie County, an extension to the St. Louis Pool of 1½ miles, gauged 1,015 bbls. in 24 hours ending at 7 a. m. on April 22. It is producing from the Hunton lime at 3,750-75 feet.

A wildcat well near the town of Sulphur, Okla., in Murray County, has the first showing of oil that has been found in the county. The well, the Bison Oil Co.'s No. 1 Labor, NW cor., Section 17-1n-2e, showed 500,000 feet of gas and 5 bbls. of heavy oil in sandy shale from 2,185-2,228 feet. The test is shut down in shale at 2,230 feet.

Pipe Mills Busy on Monroe-St. Louis Line And Oil Line Order

By B. E. V. Luty

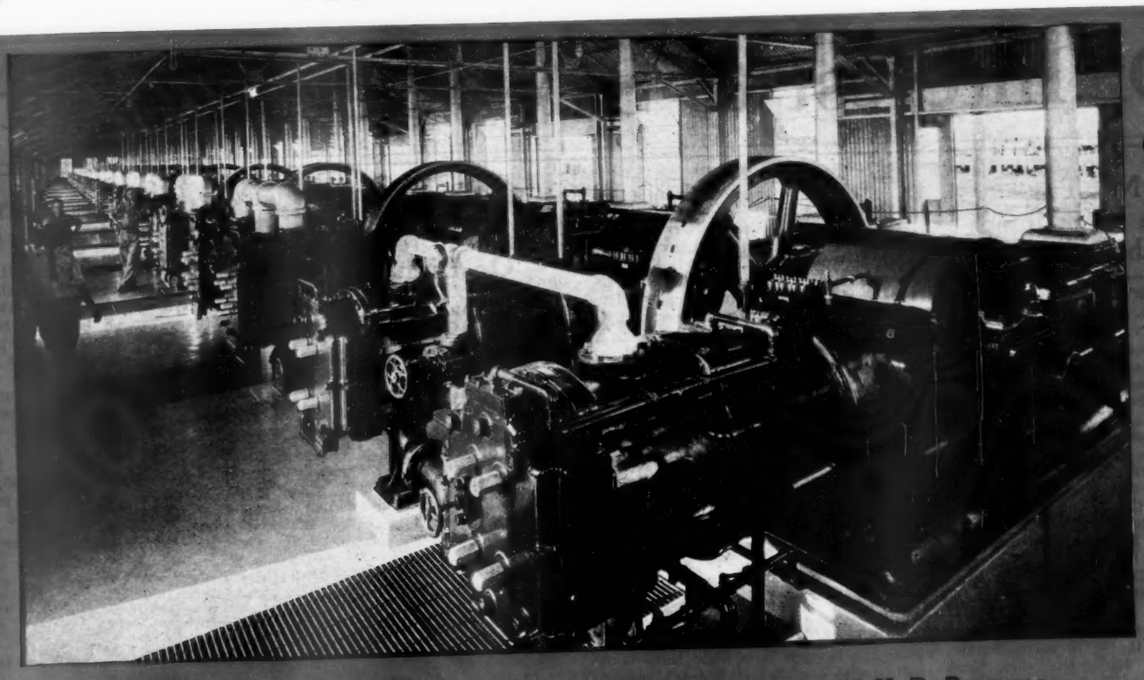
PITTSBURGH, Pa., Apr. 22.—Pipe mill operations have gone up about five points in the past fortnight, being now at about 55 per cent of capacity. The increase is due partly to the slow seasonal increase in demand for standard or merchant pipe and partly to inception of manufacture of line pipe for the Monroe and St. Louis natural gas line, which is a rush job as the buyers wished to begin laying pipe three weeks after making the purchase. The A. O. Smith Corp., National Tube Co. and Spang, Chalfant & Co., secured the order, and there was placed at about the same time 200 miles of 10-inch oil line pipe.

Seamless tube mills continue operating at about 70 per cent, approximately their rate for a couple months past. For the tubular goods industry as a whole the general rate is now close to 60 per cent.

There has been no bad news in the steel trade in the past week, but the good news seems to be practically all out now. It is a trifle later than usual for the regular seasonal turn. On an average peak production of steel is reached in the latter part of March, the volume of buying decreasing somewhat before that time, and generally steel production begins decreasing very soon after it has stopped increasing. This year substantially the peak rate was reached by the middle of March, about 12 per cent above the highest rate attained prior to this year, but up to date there is no visible recession and the common prediction is that there will be no material decrease before some time next month.

There was quite a rush of buying and specifying in March in merchant bars, sheets and strips to take advantage of old prices, higher prices being quoted for the current quarter, and naturally buying and specifying has been lighter since April 1 in these lines. Mills in these lines had shipping orders piled up for from four to six weeks of production and even with a much lower rate of buying it will take these mills quite a while to catch up, unless there are postponements of some deliveries already ordered, which is always a possibility, particularly with the automobile industry. Until a week or two ago all the automobile trade reports were of increasing production of cars and trucks, but since then there have been little points indicating that the industry's operation has grown wobbly, some makers decreasing their operations somewhat while some others still report increases. The general guess is that automobile production will total at least as much in April as in March but there is room for much doubt as to May, and if May production is to be off there will have to be some postponements of steel deliveries, for with the rate at which the mills are shipping steel and the amount of business they have on books, to continue these shipments, there would be as much steel delivered to the automobile industry in May as there has been hitherto.

The other finished steel lines, shapes, plates and wire products, are doing much the same as formerly, except along the line that there has been much heavier letting of fabricated structural steel contracts in the past six weeks than formerly, which increases the movement of shapes, also of plates to a limited extent. The heaviest tin plate deliveries of the year always occur in May and June and the tin plate industry is now speeding up a trifle in consequence. All the prospects are that this year will make a new record in tin plate consumption, as last year did, 1927 having been a slightly off year.



Stewart plant of the Carter Oil Co. with its long line of eighteen 165 H. P. Bessemer Twin Type Tens equipped with 17x17x20 Bessemer Type V. H. Compressor Cylinders.

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TWENTY YEARS or more of continuous service is the rule—not the exception with Bessemers. They are built so that they don't know what wear-out means; they take 24-hour-a-day service for granted and they are unconscious of the passage of the years. And during their decades of service they unfailingly deliver their 99%+ running time.

That is why one large user after another standardizes on Bessemers—for gasoline plants, air-gas lift plants, booster stations, vacuum plants, pumping, pipe line stations and drilling. Experience has proved conclusively that Bessemers unquestionably cost less by the year.

THE COOPER-BESSEMER CORPORATION
formerly
The C. & G. Cooper Company and the Bessemer Engine Company
Mt. Vernon, Ohio. Grove City, Pa.

BESSEMER

Of Interest to Sales Departments

State Can Not Tax Gasoline Consumed If Purchased Outside

By Charles E. Kern

Washington Bureau, The Oil and Gas Journal

WASHINGTON, D. C., Apr. 20.—A state tax on gasoline used for fuel in interstate trade is held to be invalid as such tax, it is declared by the Supreme Court of the United States, violates the constitutional prohibition against a state placing burdens on commerce. This is the case of James R. Helson and Clyde Randolph, partners under the firm name of Metropolis Ferry Co., plaintiffs in error against the Commonwealth of Kentucky. These plaintiffs in error operated a ferry between Kentucky and Illinois doing exclusively interstate business.

The State of Kentucky passed a law laying a tax on the sale of gasoline at wholesale and the statutory definition of "wholesale" made the tax apply on gasoline used within the state even though purchased outside the jurisdiction. In the lower courts judgment was rendered for the taxing authorities.

Justice Sutherland delivered the opinion of the Supreme Court as follows:

"This is an action brought by the Commonwealth of Kentucky against plaintiffs in error to recover an amount levied under Section 1, c. 120, Acts 1924 (Note No. 1), which imposes a tax of 3 cents per gallon on all gasoline sold within the commonwealth at wholesale. The words 'sold at wholesale' are defined to include 'any and all sales made for the purpose of resale or distribution or for use,' and also to include any person who shall purchase such gasoline without the state and 'sell or distribute or use the same within the state.' The tax was increased from 3 cents to 5 cents a gallon by Section 1, c. 169, Acts 1926.

"The plaintiffs are engaged in operating a ferry boat on the Ohio River between Kentucky and Illinois. They do an exclusively interstate business. They are citizens and residents of Illinois. Their office and place of business and the situs of all their personal property is in that state. The motive power of the boat is created by the use of gasoline, all of which is purchased and delivered in Illinois. It is stipulated that 75 per cent of this gasoline was actually consumed within the limits of Kentucky, but all of it in the making of interstate journeys. The tax was computed and imposed upon the use of the gasoline thus consumed.

"The trial court rendered judgment for the commonwealth, which was affirmed by the State Court of Appeals. The State Court of Appeals held that the tax was not a property tax, but an excise, and, therefore, the uniformity clause of the State Constitution was not involved. The claim under the commerce clause of the Federal Constitution was denied on the ground that the tax was confined to gasoline used within the limits of the state and the commerce clause was not affected. It is with the later question only that we are here concerned.

Regulation of Commerce

"Regulation of interstate and foreign commerce is a matter committed exclusively to the control of Congress, and the rule is settled by innumerable decisions of this court, that a state law which directly burdens such commerce by taxation or otherwise, constitutes a regulation beyond the power of the state under the Constitution. It is likewise settled that transportation by ferry from one state to another is interstate commerce and immune from the interference of such state legislation.

"The power vested in Congress to regulate commerce embraces within its control all the instrumentalities by which that commerce may be carried on. A state cannot 'lay a tax on interstate commerce in any form, whether by way of duties laid on the transportation of the subjects of that commerce, or on the receipts derived from that transportation, or on the occupation or business of carrying it on.'

"The tax is exacted as the price of the privilege of using an instrumentality of interstate commerce. It reasonably cannot be distinguished from a tax for using a locomotive or a car employed in such commerce. A tax laid upon the use of the ferry boat would present an exact parallel. And is not the fuel consumed in propelling the boat an instrumentality of commerce no less than the boat itself? A tax, which falls directly upon the use of one of the means by which commerce is carried on, directly burdens that commerce.

"If a tax cannot be laid by a state upon the interstate transportation of the subjects of commerce, as this court definitely has held, it is a little more than repetition to say that such a tax cannot be laid upon the use of a medium by which such transportation is effected. All restraints by exactions in the form of taxes upon such transportation, or upon acts necessary to its completion, are so many invasions of the exclusive powers of Congress to regulate that portion of commerce between the states."

TRENDS IN GASOLINE AND LUBRICATING OIL

NEW YORK, Apr. 22.—Specifications for lubricating oils and the improbability of an early need for gasoline substitutes were discussed at a meeting of the metropolitan section of the Society of Automotive Engineers at the Park Central Hotel here.

Neil MacCoull of The Texas Company, taking up the question of the much talked-of gasoline famine, classed as absurd the possibility of other products for gasoline for many years to come. Discussing the question of substitutes, he declared that the total production of molasses last year, if converted into alcohol, would yield not to exceed 5 per cent of the gasoline consumed during the year. All of the soft coal produced in 1928, if coked, would produce only sufficient light oils to meet 10 per cent of the gasoline consumption, he added. And, he declared, the cost of such substitutes would be prohibitive, running in the neighborhood of 50 cents per gallon. In the early days of refining, Mr. MacCoull continued, the gasoline yield was not much over 20 per cent. A decade ago, he pointed out, a gasoline famine by 1926 was predicted, but the industry met this threat by increasing the gasoline yield to about 65 per cent, and up to 70 per cent in some cases, by the use of the cracking process.

George A. Round of the Vacuum Oil Co. declared that lubricating oil values cannot be judged solely on the basis of specifications. Quoting extracts from the A.S.T.M. pamphlet, "The Significance of Tests of Petroleum Products," Mr. Round declared that it is not feasible to adhere rigidly to specifications of gravity, pour point, carbon residue, color or viscosity. Government specifications, he added, have proved useless in some instances. The United States Army ordnance advisory committee encountered difficulty, he declared, by adhering to specifications and finally established an approved list of lubricants, purchasing these without regard to specifications. New York State and the Navy Department, he concluded, now follow a similar course in purchasing lub oils.

New York Establishes Flash Specification On Light Distillates

NEW YORK, Apr. 20.—Governor Roosevelt has signed the bill, introduced by the reorganization committee, providing for the amendment of the general business law with relation to the standards and storage of illuminating oils.

The amendment provides that oil for illuminating or heating purposes may not be sold which will flash at a temperature below 100 degrees Fahrenheit, as determined by the "Tag" closed tester prescribed and the method adopted by the American Society for Testing Materials for flash point of volatile flammable liquids.

No such oil or fluid which will ignite at a temperature under 295 degrees Fahrenheit, as determined by the standard method of test for flash and fire points by means of the A.S.T.M. open cup, shall be burned or carried as freight in any passenger or baggage car, or passenger boat propelled by steam or electric power in New York State.

The sections amended were obsolete in language and required the State Board of Health to prescribe tests and instruments by which oils should be tested. The Health Board has not done this work for some years back.

Other provisions of the law, concerning naphtha and other illuminating products of petroleum which will not stand the flash test required as to limitation of use for illuminating or heating purposes, remain unchanged.

NICARAGUA ENACTS LAW REGULATING STORED OIL

NEW YORK, Apr. 20.—The Nicaraguan Congress has enacted a law providing revisions in the regulations covering the importation and storage of inflammable materials, including petroleum and gasoline. Under the revised law, any person or firm may import these materials. Previously, a special license was required, which called for the posting of a $10,000 bond.

Under Article 2 of the revised law, the collector of customs is required to provide adequate storage places at ports. While it is not the intention of the customs to build special warehouses for storage of gasoline and other inflammable products, permits will be issued to importers to store these materials in small lots in a customs building on the outskirts of the port. Importers of large lots will be permitted to establish and maintain, at their own risk and expense, warehouses situated outside the city limits of the ports. Quantities of inflammable materials exceeding 20 cases of 10 gallons each will not be permitted to be stored within city limits.

SHELL EXPANDS IN EGYPT

The Shell Petroleum Corp. has recently opened new marketing facilities at Suan, Egypt. Since the completion of the Senner Dam, the consumption of gasoline and kerosene has greatly increased throughout the entire Sudan, and an ocean installation has accordingly been constructed, consisting of storage tanks into which tank steamers discharge directly, and a tin factory and case-making plant. Allowance has been made for considerable future extension, but at present the installation consists of storage tanks for more than 2,000,000 gallons of gasoline and 1,000,000 of kerosene, the factories mentioned, storage godowns, etc. A special petroleum jetty has been provided and suitable railway sidings installed.

MEXICAN EXPORTS SHOW CONSIDERABLE DECREASE

NEW YORK, Apr. 21.—Exports of light and heavy crude oil, topped crude, and distillates from Mexico during February totaled 1,533,494 bbls., a drop of 727,159 bbls. from the previous month and 1,798,876 bbls. under the exports for February last year.

Pan American Petroleum & Transport Co. was the largest shipper in February, with a total of 476,228 bbls. Standard Oil Co. of New Jersey ranked second with 406,336 bbls., with Mexican Eagle in third position with 395,510 bbls.

Export totals for the month, by companies, with comparative data, follow:

(Barrels of 42 gallons)

	Feb., 1929	Feb., 1928
Pan American	476,228	1,251,904
Mexican Eagle	395,510	966,979
Standard of N. J.	406,336	288,135
Mexican Sinclair	52,088	232,715
Empire Gas & Fuel	.....	190,101
Penn Mex Fuel Co.	.....	116,756
Royal Dutch	134,997	103,167
The Texas Co.	.....	70,866
Gulf Coast Corp.	.....	63,065
Pierce Oil Co.	.....	.....
Miscellaneous	68,335	48,682
Total	1,533,494	3,332,370

UNCRATED PLANE SHIPPED TO EUROPE ON LINER

NEW YORK, Apr. 20.—For the first time in commercial transatlantic shipping an uncrated airplane has been carried as excess baggage on the deck of a steamer.

The Standard Oil Co. of New Jersey's "Wasp" Lockheed-Vega was dismantled in two sections, hoisted aboard and lashed to the after deck of the Ss. Paris, on the French liner's last voyage from New York. Capt. E. E. Aldrin, head of the company's aviation activities, sailed the week before on the Ile de France and will meet the plane at Havre.

Captain Aldrin will fly the trim red-and-white Lockheed all over Europe this Spring in a two months' tour of the continent in the interests of his company. Great Britain, the Netherlands, Belgium, Germany and the Scandinavian countries are on the first leg of the flight. Then the captain will turn back through Poland and Czecho-Slovakia, Austria and Jugo-Slavia. Italy is next on the schedule, then Switzerland and finally, France. Captain Aldrin expects to return to this country sometime in June.

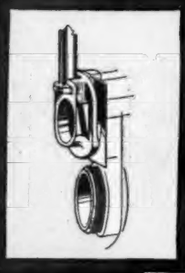
The European flight is in accordance with the Standard's established policy of aviation promotion. Over 25,000 miles have been covered in this country by the plane, which has been in use only seven months, being employed chiefly as a sort of flying laboratory for checking aviation fuels and lubricants. In addition, the company is marking all its warehouse roofs with the name of the town and direction of the nearest airport, as well as co-operating with municipalities in the establishment, improving and servicing of flying fields and aviation centers.

CANADIAN OIL IMPORTS

CHATHAM, Ontario, Apr. 21.—Recent official figures show a marked increase in crude petroleum imports to Canada, which in 1927 reached 684,919,709 gallons valued at $31,133,884, and last year increased to 857,439,345 gallons valued at $35,686,942. Gasoline imports increased from 108,168,328 gallons valued at $11,418,694 to 140,851,295 gallons valued at $16,476,200; and imports of lubricating oils went up from 12,537,957 gallons valued at $3,744,563 to 15,487,955 gallons valued at $4,502,463. On the other hand, fuel oil imported declined from 119,214,042 gallons valued at $5,067,448 to 95,219,476 gallons valued at $3,434,126.

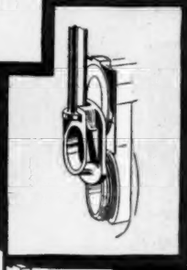
Always Clean—Efficient

SCALE AND SEDIMENT-SLICED OFF DISCS AND SEATS EVERY TIME OPERATED—AS ONE HAND WASHES THE OTHER



Accumulated scale and sediment cause most valve leaks and misalignment. A clean valve is leak-proof.

KELLY NEWAYS eliminate these troubles. While open, the discs are fully protected by their metal-to-metal contact with protector plates. *No scale or sediment can accumulate.* As the valve is closed, the discs automatically clean and polish the seats—as one hand washes the other.



Again there is a positive, clean, metal-to-metal contact. Kellys are *always clean—always tight—efficient.*

This is but one of *nine* such important exclusive Kelly advantages. Let us tell you them all. Return the coupon.

KELLY CO.
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Gentlemen—Please send me full information on your Kelly Neway Valves.

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VALVES

ALSO MANUFACTURERS OF KELLY SELF-GRINDING GLOBE AND ANGLE VALVES

WILDCAT OPERATIONS IN OKLAHOMA

(Continued from Page 56)

HUGHES COUNTY

The Texas Company's No. 1 Bryan, SE NE SW Sec. 9-6-8e ..... Rig on ground.
McGee Co.'s No. 1 fee, SE cor. Sec. 25-8-11e ..... Rig on ground.

JACKSON COUNTY

Altus Oil Co.'s No. 1 Northington, NE cor. NE Sec. 4-1-20w ..... Shut down 2,020 ft.

KAY COUNTY

Wentz Oil Corp.'s No. 1-A Ward, C NE SE SW Sec. 32-27-1e ..... Drlg. 3,805 ft.

KINGFISHER COUNTY

McKenna & Crawford's No. 1 Sturgeon, NE cor. SW Sec. 27-16-6w ..... Shut down 4,895 ft.

KIOWA COUNTY

Blue Mountain Oil Co.'s No. 1 Jones, SE cor. NW NW Sec. 17-5-14w ..... Abandoned 530 ft.
C. B. Cloyes' No. 1 Brazill, SW cor. NE Sec. 34-7-17w .. Drlg. 1,425 ft.
Merrick Oil Co.'s No. 1 Kelly, NW cor. SE Sec. 20-7-17w .. Fishing 815 ft.
McWharter et al's No. 1 Sherwood, CWL NW NE Sec. 2-5-17w ..... Drlg. 487 ft.

LATTIMER COUNTY

Limestone Oil & Gas Co.'s No. 1 McMurray, SW cor. SW Sec. 15-5-18 ..... Underreaming 6-in. csg. 3,425 ft.

LINCOLN COUNTY

Phillips Pet. Co.'s No. 1 Stephens, SE cor. NW Sec. 29-12-3 ..... Rig.
Morgan & Flynn's No. 1 Finlay, SW cor. SW Sec. 19-16-6 ..... Shut down 710 ft.
Wheeler & Mote's No. 1 Kemmer, NW cor. NE SW Sec. 2-16-5 ..... Shut down 3,165 ft.
Slusher's No. 1 Barnes, NW cor. Sec. 22-13-19e ..... Machine.

LOGAN COUNTY

Haley & Smith's No. 1 Guier, SE cor. SW Sec. 33-18-3w .. Cleaning out 3,970 ft.
Washoma Oil Co.'s No. 1 Phillips, C NW SW Sec. 13-19-10w ..... Rig on ground.

McCLAIN COUNTY

Tidal Oil Co.'s No. 1 Davis, C SE SE Sec. 31-5-2e ..... Drlg. 3,868 ft.

McINTOSH COUNTY

Spring Valley Oil Co.'s No. 1 Carr, SE cor. NE NW Sec. 16-10-13e ..... Rig.
Patterson and others' No. 1 Smith, SW cor. NW SE Sec. 32-9-16 ..... Shut down 5,470 ft.
Wolfe et al's No. 1 Unknown, NW cor. SE Sec. 15-12-18.. Rig on ground.

MAJOR COUNTY

Randau & Mooney's No. 1 Parker, SE cor. NE NW Sec. 4-23-16w ..... Show oil 1,235 ft.; shut down;
Earl and others' No. 1 Turner, C NE NE Sec. 23-20-14w .. Rig.
Wilson et al's No. 1 Unknown, NE cor. NE Sec. 4-23-16w .. Shut down 510 ft.
Sinclair Oil & Gas Co.'s No. 1 Showalter, C SW SW Sec. 33-27n-16w ..... Rig.

MUSKOGEE COUNTY

Tulkogee Oil Co.'s No. 1 Thompson, NW NE Sec. 31-15-20e ..... Machine.
Slusher's No. 1 Barnes, NE cor. Sec. 22-13-19e ..... Machine.
J. L. Slusher's No. 1 Nave, NE cor. SW NW Sec. 20-15-20 ..... Shut down 775 ft.
Colton & Lester's No. 1 Ellington, SW cor. NW SW Sec. 25-12-19 ..... Water 1,092-1,170 ft.; hole full water; abandoned.
Colton & Lester's No. 1 Parker, C NW SW Sec. 31-12-19.. Drlg. 1,703-26 ft.

OKFUSKEE COUNTY

T. B. Slick, Inc.'s No. 1 Berry, SE cor. NE SE Sec. 21-11-7 ..... Fishing 4,585 ft.
Erwin and others' No. 1 Patterson, NW cor. SE Sec. 15-13-9 ..... Location.
Prairie O. & G. Co.'s No. 1 Palmer, NW cor. NW NE Sec. 2-11-9 ..... Drlg. 2,150 ft.

OKLAHOMA COUNTY

Mid-Kansas' No. 1 Trosper, NE NW Sec. 19-12-1w ..... Location.
Slick & Bailey's No. 1 Koester, C SE NE Sec. 18-13-3w .. Shut down 5,130 ft.
Cromwell & Franklin's No. 1 Thompson, SW cor. NE NE Sec. 15-12-3w ..... Granite 7,167-7,180 ft.; shut down.
Hall & Briscoe's No. 1 Holmes, NE cor. SW SE Sec. 10-11-3w ..... Shut down 4,750 ft
Wall & McElroy's No. 1 Brady, NE cor. NE SW Sec. 6-11-2w ..... Rig abandoned.

PITTSBURG COUNTY

Kerr & Koy's No. 1 Hall, C NW NW Sec. 32-4-12 ..... Fishing 1,800 ft.

PONTOTOC COUNTY

Denver P. & R. Co.'s No. 1 Roberts, SE cor. NE NE Sec. 36-5-4 ..... Drlg. 2,785 ft.

POTTAWATOMIE COUNTY

T. B. Slick's No. 1 Sailor, SE cor. NW NW Sec. 12-8-3 .. Water; drlg. 5,425 ft.
Mid-Continent Petroleum Corp.'s No. 1 James, SE cor. SE Sec. 22-5-3 ..... Drlg. 3,345 ft.
Simms Oil Co.'s No. 1 Lester, SE cor. NE NE Sec. 19-6-4 ..... T.V. 3,640 ft.; drlg. 3,698 ft.; 2,000 bbls.

SEMINOLE COUNTY

Indian Territory Illuminating Oil Co.'s No. 1 Peterson, SE SW NW Sec. 24-7-5e ..... Drlg. 3,854 ft.
Prairie's No. 1 Patton, NW NE Sec. 18-6-8e ..... Location.
Indian Territory Illuminating Oil Co.'s No. 1 Factor, SW NE SE Sec. 3-5-7e ..... Location.
Continental Oil Co.'s No. 1 Proctor, SE cor. NE NE Sec. 5-8-8e ..... Drlg. 800 ft.
Prairie & Slick's No. 1 Miller, NW cor. NE Sec. 8-8-8e.. Spudding.
Burke-Greis Oil Co.'s No. 1 Cyrus, SE cor. NE NW Sec. 13-9-7 ..... Wilcox 4,254-63 ft.; hole full water; abandoned.
Gypsy Oil Co.'s No. 1 Andrews, NE SE NW Sec. 27-10-7 ..... Drlg. 4,504 ft.
McCulloch Oil Co.'s No. 1 McBray, SW cor. SW NE Sec. 4-8-8 ..... Drlg. 3,440 ft.
McCulloch Oil Co.'s No. 1 Powell, NW cor. NW Sec. 11-6-5 ..... Rigging up rotary.
Marland Oil Co.'s No. 1 Strothers, NW cor. SE NE Sec. 5-10-7 ..... Wilcox 4,925-42 ft.; hole full water; P.B. to 4,595 ft. to list.
Magnolia Pet. Co.'s No. 1 Harjo, NE cor. SE Sec. 34-6-7.. Drlg. 3,240 ft.
T. B. Slick and others' No. 1 Davis, NE cor. NE Sec. 26-6-6 ..... Water 4,303-4,357 ft.; hole full water; shut down.
McCulloch Oil Co.'s No. 1 Powell, NW cor. NW Sec. 11-6-5 ..... Rig.

SEQUOYAH COUNTY

Cooper & Badger's No. 1 Young, NW cor. NE NE Sec. 7-12-20 ..... Shut down.
Hunt and others' No. 1 Unknown, SE cor. NW SW Sec. 12-12-23 ..... Shut down 1,105 ft.
Buffington et al's No. 1 Melcher, C SW NW Sec. 31-12-24 ..... Drlg. 3,000 ft.

WOODS COUNTY

E. K. Miller's No. 1 Copenhavers, NW cor. NW Sec. 18-24-13w ..... Rigged up and shut down.
Gypsy-Prairie and others' No. 1 Thompson, SE cor. SW Sec. 10-25-15w ..... Drlg. 4,810 ft.
Sinclair Oil & Gas Co.'s No. 1 Showalter, C SW SW Sec. 33-27-16w ..... Rig and tools.

WOODWARD COUNTY

Sharon Oil Co.'s No. 1 Elmore, SW cor. SW Sec. 25-21-21w ..... Rig blown down 3,025 ft.; shut down.
Prairie Oil & Gas Co. et al's No. 1 James, NE cor. NW Sec. 23-23-17w ..... Drlg. 2,700 ft.
Billy's Oil Co.'s No. 1 Watt, C SE Sec. 9-23-20w ..... Shut down 3,612 ft.
Burgoyne Brothers' No. 1 Merkins, SW cor. SE NE Sec. 15-21-19w ..... Shut down 1,910 ft.
Wilson et al's No. 1 Unknown, NE cor. SW Sec. 4-23-16w ..... Shut down 1,240 ft.

SOUTHERN OKLAHOMA

ATOKA COUNTY

Wapanucka Oil Co.'s No. 1 Banks, CWL SE SE Sec. 28-2s-9 ..... Shut down 1,530 ft.

BRYAN COUNTY

Lambert et al's No. 1 Mermann, CEL SE NE NE Sec. 27-6s-9 ..... Shut down 1,780 ft.
Yale Oil Syndicate's No. 1 Craige, C NW NE Sec. 36-9s-9e ..... Shut down 1,450 ft.

CARTER COUNTY

Avon-Dickey's No. 1 Anderson, NE cor. SE NE SE Sec. 32-4s-2 ..... Shut down 420 ft.
Schermerhorn Oil Co.'s No. 2 Joliff, NE NW Sec. 24-5s-1e ..... Fishing 4,536 ft.
Humble Oil & Ref. Co.'s No. 1 Chapman, C SW NW NW Sec. 1-4-3 ..... Drlg. 1,425 ft.

CHOCTAW COUNTY

Choctaw Petroleum Co.'s No. 1 Wilson, SW cor. SW Sec. 15-6-19 ..... Shut down 1,346 ft.

COTTON COUNTY

Everetts et al's No. 1 Hall, SE NW Sec. 36-4-13w ..... Drlg. 2,172 ft.
Kirbow et al's No. 1 Brown, NE SW Sec. 35-3-12w ..... Rig.
Perkins & Callum's No. 1 Tucker, NW NE Sec. 11-3-10w ..... Drlg. 2,513 ft.
Pewlin Pet. Co.'s No. 1 King, SW SE Sec. 22-3-9w .... Drlg. 510 ft.
Amerada Pet. Corp.'s No. 1 Dulaney, SE cor. NW NW Sec. 31-4-9w ..... Fishing 1,535 ft.
Consolidated Oil Co.'s No. 1 Indian Land, NE SW Sec. 11-3-12w ..... Drlg. 1,715 ft.
Pierce & Brown's No. 1 Hertzler, NW cor. NW Sec. 31-2-12w ..... Shut down 2,716 ft.
Shasta Oil Co.'s No. 1 Pah-pe-chi, NE cor. NE Sec. 34-1s-11w ..... Shut down 2,502 ft.
White et al's No. 1 Woodruff, NW NE SE 18-3-11w .... Drlg. 840 ft.

JOHNSTON COUNTY

Smith & Knisely's No. 1 Lane, E half Sec. 29-1-7 ..... Drlg. 1,660 ft.
Bush Creek Oil Co.'s No. 1 Kirby, SE cor. NE NW Sec. 9-4-7 ..... Shut down for casing 405 ft.

MARSHALL COUNTY

Neff et al's No. 1 Strothers, C SW NE NE ..... Drlg. 501 ft.
Moore et al's No. 1 McDuffy, SW cor. NE SW Sec. 3-7s-6 ..... Shut down 680 ft.

MURRAY COUNTY

Alter and others' No. 1 Johnson, SW cor. NW Sec. 14-4-7.. Spudded and shut down 350 ft.

STEPHENS COUNTY

Smythe et al's No. 1 Shaw, C NE NE Sec. 27-2-8w .... Rig on ground.
Ellis Drilling Co.'s No. 1 Yates, SW NE Sec. 4-3-7w .... Rig.

TILLMAN COUNTY

Cochran & Ridgway's No. 1 Barnes, C NW NE ..... Cellar.
Burr Lambert et al's No. 1 Zivlig, C NW Sec. 25-1-15w .. Rig.
Landfair and others' No. 1 Smith, SE SW SE Sec. 6-2s-16w ..... Shut down 2,535 ft.
Allen & Treadwell's No. 1 Howell, NW cor. SE Sec. 13-1-17w ..... Drlg. 687 ft.

OKLAHOMA PANHANDLE

Magnolia Pet. Co.'s No. 1 School, C SE NE Sec. 22-5-5 .. Drlg. 1,715 ft.
Skaer's No. 1 Hitch, NW cor. Sec. 25-1-15e ..... Rig.
Three Way Oil Co.'s No. 1 Cane, SW NW Sec. 11-1-18e .. Shut down 3,350 ft.

WILDCAT OPERATIONS IN KANSAS

(Continued from Page 58)

JACKSON COUNTY

Garvin & Morton's No. 1 Lutes, SW cor. NW NW Sec. 27-7-15 ..... Drlg. 2,400 ft.

LANE COUNTY

Robinson's No. 1 Dickerson, Sec. 11-18-27w ..... Drlg. 2,650 ft.
Blankenship Pet. Co.'s No. 1 Schaeffer, NE cor. NE Sec. 24-16-28w ..... Spudded and shut down

MARSHALL COUNTY

Irwin et al's No. 1 Cooper, NE NW Sec. 10-3-7e ..... Drlg. 1,200 ft.
Empire O. & R. Co.'s No. 1 Scally, SW NE NE Sec. 28-19-2e ..... Rig spudding.

MARION COUNTY

T. C. Johnson's No. 1 Doltweler, SW cor. NE NW Sec. 3-18-4e ..... Drlg. 1,480 ft.
Hartman & Skaer and White Eagle's No. 1 Kline, NE NW Sec. 28-18-3e ..... Drlg. 2,270 ft.
Connell & Prairie's No. 1 Zirak, SE cor. SW Sec. 3-18-3e ..... Drlg. 1,900 ft.
General Utilities Co.'s No. 1 Burkholder, Sec. 18-19-3e .. Drlg. 1,840 ft.
General Utilities Co.'s No. 1 Propp, NE cor. SE SW Sec. 8-19-4e ..... Rig.
Helmerich & Payne's No. 1 Rosen, NE cor. SE SW Sec. 25-21-2w ..... Shut down 450 ft.
Derby & Shaw's No. 1 McNeill, C SW NW Sec. 15-19-4e.. Drlg. 2,150-55 ft.; hole full water; abandoned.
J. E. Hauna's No. 1 Pankratz, NE cor. NE SW Sec. 13-20-3 ..... Rig.
A. E. Meyers' No. 1 Papp, SW cor. SW NE Sec. 10-18-2.. Drlg. 2,750 ft.
Frank L. Moore's No. 1 Miller, NE cor. NE Sec. 26-19-1.. Drlg. 1,045 ft.

McPHERSON COUNTY

Morrison & Shydell's No. 1 Shindberg, SE cor. NW Sec. 18-19-2w ..... Drlg. 120 ft.
McPherson O. & G. Co.'s No. 1 Rasmusson, SW cor. Sec. 8-18-3w ..... Spudding, shut down.
Ted Washabaugh's No. 1 Vosshell, NE cor. NE Sec. 9-21-3w ..... Drlg. 2,981 ft.
McPherson Gas Co.'s No. 1 Reitz, NW cor. SE SW Sec. 1-20-2w ..... Drlg. 410 ft.
Lariaux et al's No. 1 Martinson, NE cor. Sec. 9-19-3w .. Rig.
Vickers Pet. Co.'s No. 1 Wedell, C SW Sec. 12-20-2w .... Rig.
Mid-Kansas Oil & Gas Co.'s No. 1 Yoder, C NW SW Sec. 8-20-4w ..... Drlg. 3,655 ft.; underreaming 6-in. casing.
J. H. Tatlock's No. 1 Hayer, C SW NE Sec. 32-20-1w .... Drlg. 550 ft.
Marland Prod. Co.'s No. 1 Wilkering, C SW SW Sec. 9-21-1w ..... Drlg. 3,174 ft.

MORRIS COUNTY

Hiatt et al's No. 1 Blythe, NW NE Sec. 35-15-5e ..... Drlg. 1,530 ft.

NESS COUNTY

Barnsdall Oil Co.'s No. 1 Lauk, C SW Sec. 35-18-21w .. Drlg. 3,675 ft.

NORTON COUNTY

Southwestern Petroleum Co.'s No. 1 Montague, NE SW Sec. 28-1-22w ..... Shut down 1,480 ft.

OSBORNE COUNTY

Empire O. & R. Co.'s No. 1 Crest, SE NE Sec. 30-9-14w ..... Drlg. 2,915 ft.
Trees Oil Co.'s No. 1 Payenter, NE cor. SE SE Sec. 22-8-15w ..... Drlg. 300 ft.
S. D. Jarvis' No. 1 Jellison, SE cor. SE Sec. 13-10-15w .. Drlg. 2,636 ft.

OTTAWA COUNTY

Anderson et al's No. 1 Bank, NE cor. NW Sec. 28-10-2w .. Drlg. 3,370 ft.

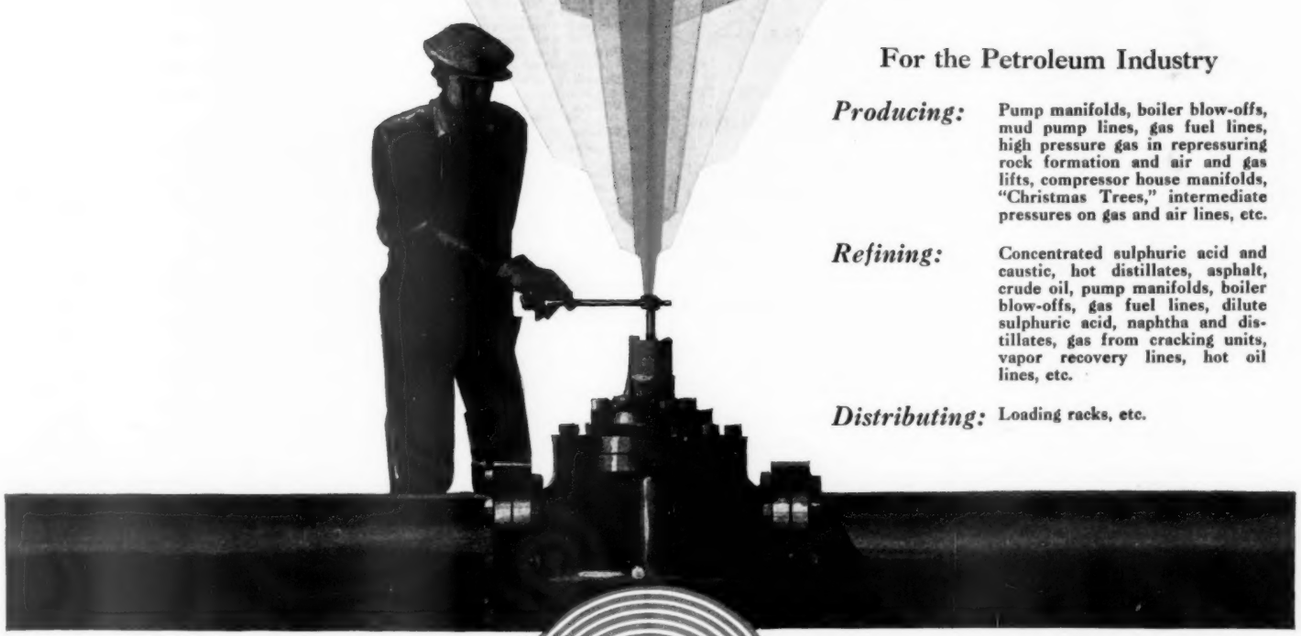
PAWNEE COUNTY

F. C. Troupe's No. 1 Lovett, CEL NE NE Sec. 31-21-16w. Shut down 1,560 ft.

PHILLIPS COUNTY

Watsonian-British American's No. 1 Neiman, C SW SW Sec. 34-2-19w ..... Drlg. 1,800 ft.

a ton of pressure at your finger tips



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Producing: Pump manifolds, boiler blow-offs, mud pump lines, gas fuel lines, high pressure gas in repressuring rock formation and air and gas lifts, compressor house manifolds, "Christmas Trees," intermediate pressures on gas and air lines, etc.

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Distributing: Loading racks, etc.

Hydraulic lubricant pressure available in every Nordstrom Valve at a slight turn of the lubricant screw and plug, permanently seals the valve against leaks and releases the tapered plug if it ever becomes tight. A turn of the lubricant screw and plug, completing the entire operation, is a matter of but a few seconds and requires no special tools or skill. This simple hydraulic lubricating principle has revolutionized the valve industry.

The Lubricant Is of Special Composition

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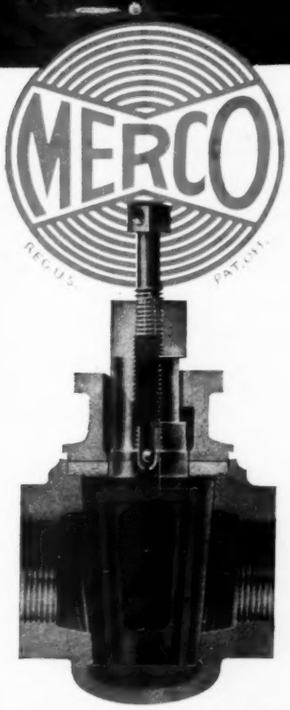

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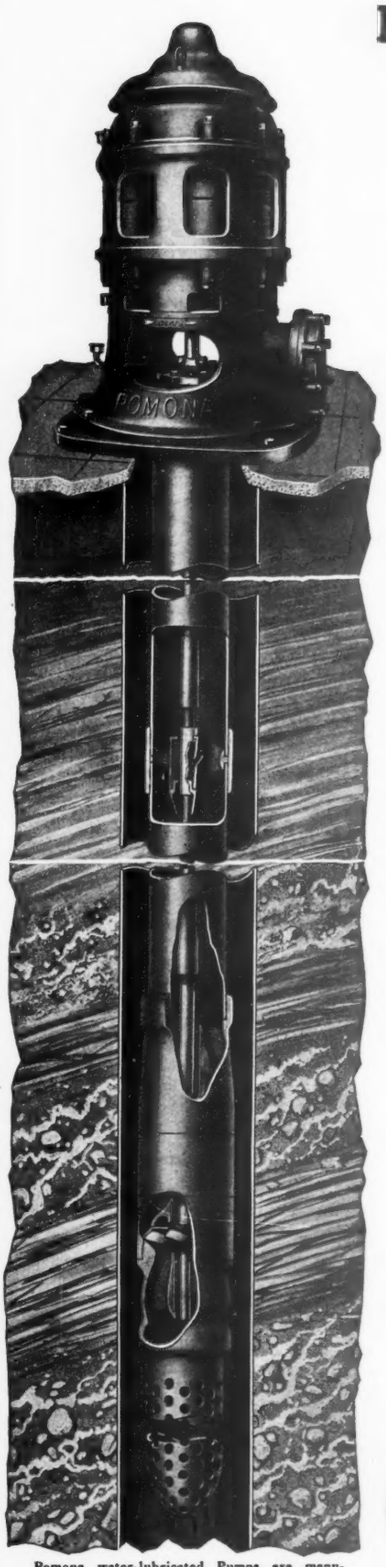
Water-lubricated
Super-Turbine

Pumps



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Pomona water-lubricated Pumps are manufactured for production from 25 to 4,500 gallons per minute and for installation in wells as small as 4" inside diameter. Twenty different types of heads to meet practically every known pumping condition.

Watsonia Oil Co.'s No. 1 Marklein, NE cor. SW Sec. 21-3-19w ..... Drlg. 3,920 ft.
British American Oil Co.'s No. 1 Weinman, C SW SW Sec. 34-2-19w ..... Drlg. 1,820 ft.

PRATT COUNTY

O'Haver & Jones' No. 1 Lunt, C SW NW Sec. 15-28-14w.. Shut down 300 ft.
Empire O. & R. Co.'s No. 1 Henderson, SW cor. Sec. 35-25-4w ..... Rig.

RENO COUNTY

Perry et al's No. 1 Oswald, NE cor. NE SE Sec. 30-22-5w ..... Fishing 2,340 ft.
Milmac Oil Co.'s No. 1 Strickley, SW cor. SW Sec. 17-26-5w ..... Drlg. 1,425 ft.

RICE COUNTY

Allison & Fitzwilliams' No. 1 Poland, NE cor. SW NE Sec. 36-19-8w ..... Cellar.
Higgins & Stembubble's No. 1 Shurr, NE cor. SW Sec. 21-20-10w ..... Shut down 1,820 ft.

RILEY COUNTY

Derby & Shaw's No. 1 Lindstrom, NE cor. Sec. 32-7-5e.. Rig.

RUSSELL COUNTY

Allison & Fitzwilliams' No. 1 Mohenny, NW SE Sec. 5-14-12w ..... Rig.
Phillips Pet. Co.'s No. 1 Salback, SE NW Sec. 32-12-14w ..... Rig on ground.
T. B. Slick's No. 1 Lellaus, SW cor. NE Sec. 36-15-13w.. Drlg. 320 ft.

BOOKS COUNTY

Burford-Brim's No. 1 Toxa, Sec. 22-9-17w ..... Rig.
Prairie O. & G. Co.'s No. 1 Ack, SE cor. Sec. 22-9-19w.. Drlg. 2,925 ft.
Prairie Oil & Gas Co.'s No. 1 Sandberg, C SW Sec. 20-9-18w ..... Drlg. 3,384 ft.

BUSH COUNTY

Sinclair Oil & Gas Co.'s No. 1 Sims, C SW NW NW Sec. 8-18-17w ..... Rig.
Danciger Oil Ref. Co.'s No. 1 Swindt, SW cor. Sec. 22-17-17w ..... Drlg. 540 ft.
Barnsdall Oil Co.'s No. 1 Brock, C SE SE Sec. 21-17-17w ..... Spudding.
Central Commercial Oil Co.'s No. 1 Brock, SE cor. SW SW Sec. 12-17-16w ..... Shut down.
Phillips Pet. Co.'s No. 1 Legleiter, NE cor. NW SE Sec. 10-16-18w ..... Drlg. 3,570 ft.
Danciger Oil Ref. Co.'s No. 1 Poland, NE cor. SW NE Sec. 17-19-17w ..... Drlg. 2,065 ft.
Wilcox Oil & Gas Co.'s No. 1 Schwartzkopf, NE cor. NW SW Sec. 27-17-17w ..... Drlg. 980 ft.
Wilcox O. & G. Co.'s No. 1 Woodward, NE cor. NE Sec. 35-27-17w ..... Drlg. 980 ft.

SALINE COUNTY

Dixie Oil Co.'s No. 1 Main, C SW SE SW Sec. 6-15-2w .. Rig.
Kinney-Coastal Co.'s No. 1 Hughes, NE cor. Sec. 20-13-4w. Rig on ground.
M. Estey et al's No. 1 Peterson, C NE Sec. 6-16-5w .... Spudded and shut down.
Boyle et al's No. 1 Miller, SW cor. SE Sec. 21-16-1w .... Shut down 2,615 ft.
Nathan Jones et al's No. 1 Robertson, NW cor. SW Sec. 27-14-2w ..... Drlg. 3,571 ft.
Kenney Coastal Oil Co.'s No. 1 Beal, C NW Sec. 23-14-5w ..... Drlg. 1,795 ft.
T. B. Slick's No. 1 Rosenhagen, SW SE NE Sec. 33-27-4w ..... Drlg. 1,410 ft.
Hammond & Stout's No. 1 Roeder, SW NW Sec. 23-27-2w ..... Rig.
Twist et al's No. 1 Armstrong, NE NW Sec. 28-26-1e .... Rig spudding; shut down.

SEDGWICK COUNTY

Barnett O. & G. Co.'s No. 1 Davidson, NW cor. NW SW Sec. 27-26-1e ..... Rig; spud; shut down.
Lewis et al's No. 1 Taylor, NW cor. NE Sec. 23-27-2 .... Underreaming casing, total depth 2,862 ft.
Kyser et al's No. 1 Stroot, SW cor. NW Sec. 8-26-2w .... Drlg. 3,760 ft.
Lario & Blair's No. 1 Tjaden, C NE SE Sec. 22-29-2w .. Drlg. 3,090 ft.
R. Maglason et al's No. 1 Buckles, NW cor. SE Sec. 3-28-1w ..... Shut down 250 ft.
Magnolia Pet. Co.'s No. 1 Wise, NW cor. NW Sec. 36-28-2w ..... Fishing 2,700 ft.
Blankenship et al's No. 1 Tuttle, SW cor. NW Sec. 1-27-1 ..... Drlg. 1,805 ft.; 10-in. casing.
Washabaugh et al's No. 1 Harrison, NW cor. NE NE Sec. 3-26-2w ..... Shut down 350 ft.
Morgan & Tilley's No. 1 Fitzgerald, NW cor. NE Sec. 5-26-1w ..... Shut down 800 ft., correct.
Twist et al's No. 1 Joseph, CNL SW SE Sec. 4-25-1w .... Drlg. 1,160 ft.
Connell & Slick's No. 1 Cross, NE cor. NE Sec. 27-25-1w.. Plugging back to 2,730 ft.; shot 20 qts. 2,690-2,730 ft.
Miller Wentz' No. 1 Shaffer, NW cor. NE Sec. 9-27-2w .. Shut down 1,736 ft.
Kroder et al's No. 1 Harden, SW cor. NW SW Sec. 20-26-1e ..... Shut down 1,100 ft.
Morgan et al's No. 1 Corn, SW cor. NE Sec. 28-26-1w .. Drlg. 3,260 ft.; underreaming lu
Shell Pet. Corp.'s No. 1 Lygrisse, SE cor. NE Sec. 15-26-2e ..... Underreaming 2,980 ft.; tot depth 3,054 ft.
Washabaugh et al's No. 1 Harrison, NW cor. NE NE Sec. 3-26-2w ..... Shut down 350 ft.
Sullivan et al's No. 1 Shelly, NW cor. NE SE Sec. 32-29-2e ..... Drlg. 2,340-2,410 ft.; hole full w ter.
Hartman & Skaer et al's No. 1 Hutchinson, SE cor. SE SW Sec. 23-28-3w ..... Drlg. 2,440 ft.
J. H. Tatlock's No. 1 Cook, SW cor. SW Sec. 25-28-2 .... Drlg. 2,065 ft.
Producers Oil Co.'s No. 1 Jones, SW cor. NE SE Sec. 31-26-2 ..... Drlg. 2,322 ft.
G. L. Ramsey's No. 1 Schluesser, SW cor. SW Sec. 1-25-1 ..... Drlg. 3,335 ft.
Jones & Kirk's No. 1 Sheppard, SE cor. NE Sec. 4-25-1 .. Drlg. 2,720 ft.
H. H. Patton's No. 1 Ryder, NE cor. NE Sec. 22-25-1 .... Drlg. 3,397-3,408 ft.; hole full w ter; abandoned 3,580 ft.
LaFont et al's No. 1 Carlton, C SE SE SW Sec. 24-28-1e.. Spudding.
T. B. Slick's No. 1 Rosenhagen, C SW SE NE Sec. 33-27-4w ..... Drlg. 1,410 ft.
Frank Wahn's No. 1 Wilson, C NE NW SE Sec. 9-26-1w.. Rig; moving in tools.
Patten & Wentz' No. 1 Swanson, NW cor. NE Sec. 6-26-2e. Drlg. 1,760 ft.
E. B. Hawkins' No. 1 Murfit, C SW Sec. 4-25-2w ..... Drlg. 480 ft.
Connell & Slick's No. 1 Mohannah, C NE SE SE Sec. 3-25-1w ..... Shut down 1,435 ft.; 12-in. casi 1,460 ft.
Reynolds & Rogers' No. 1 Updegraft, C SE SW SE Sec. 26-25-1w ..... Rig.
Jones & Kirk's No. 1 Sheppard, SE cor. NE Sec. 4-25-1e.. Drlg. 2,510 ft.

SHERMAN COUNTY

A. L. Henson et al's No. 1 Murry, NE cor. SE NW Sec. 22-7-40w ..... Shut down 3,035 ft.

STEVENS COUNTY

Trees Oil Co.'s No. 1 Thompson, C NE SW Sec. 3-35-38w. Drlg. 500 ft.
W. Sidwell et al's No. 1 Kelly, SW cor. NE Sec. 16-34-38w ..... Drlg. 1,320 ft.

SMITH COUNTY

Ohio Oil Co.'s No. 1 Unknown, NE SE Sec. 30-1-13w .... Drlg. 4,010 ft.
Mid-Kansas Oil & Gas Co.'s No. 1 Unknown, NE cor. NE Sec. 4-2-13w ..... Drlg. 3,360 ft.

SUMNER COUNTY

McCulloch Oil Co.'s No. 1 Teetle, SW cor. NE Sec. 29-34-1w ..... Abandoned 4,632 ft.
Gypsy Oil Co.'s No. 1 Williams, NW SE SW Sec. 16-35-3w ..... Drlg. water 4,768-76 ft.; 80 bb an hour.
Davidson and others' No. 1 Strickland, SW cor. SE Sec. 12-35-1w ..... Rig.

TREGO COUNTY

Central Commercial Oil Co.'s No. 1 Ellis, NE cor. SW NE Sec. 20-13-21w ..... Drlg. 3,748 ft.

WASHINGTON COUNTY

McCool & Vincent's No. 1 Linn, NW cor. NE Sec. 27-4-3.. Rig.

NEW LOCATIONS IN TEXAS PANHANDLE AND NORTH AND WEST TEXAS FIELDS

TEXAS PANHANDLE

Week Ended April 10

Gray County

Gulf Production Co.'s No. 1 William Jackson, 295 feet north and 305 feet east of the SW cor. of the W half of Section 62, Block B-2, H.&G.N. Survey. Panhandle Refining Co.'s No. 2 G. H. Saunders, 330 feet south and west of the NE cor. of the E half of the NE of Section 3, Block 1, A.C.H.&B. Survey. Delaney & Associates Oil Co.'s No. 8 W. Jackson, 990 feet south and 330 feet east of the NW cor. of the E half of the SW of Section 88, Block B-2, H.&G.N. Survey. Phillips Petroleum Co.'s No. 5 W. Jackson, 330 feet south and 990 feet east of the NW cor. of the S half of the NE of Section 88, Block B-2, H.&G.N. Survey.

Operators Oil Co.'s No. 7 William Jackson, 330 feet south and 270 feet west of the NE cor. of the N half of the NE of Section 88, Block B-2, H.&G.N. Survey. Magnolia Petroleum Co.'s No. 4 J. B. Bowers, 330 feet south and 270 feet east of the NW cor. of Section 63, Block B-2, H.&G.N. Survey. Wilcox-Pampa Oil Co.'s No. 6 Combs & Worley, 330 feet north and 990 feet east of the SW cor. of Section 60, Block 3, H.&G.N. Survey. Danciger Oil & Refining Co.'s No. 1 H. K. Beck, 330 feet south and east of the NW cor. of the NW of Section 28, Block B-2, H.&G.N. Survey.

Hutchinson County

Marland Production Co.'s No. 1 J. M. Sanford-C, 783 feet north and 230 feet west of the SE cor. of the N half of Section 79, Block 46, H.&T.C. Survey.

Wheeler County

Holmes and others' No. 1 I. Close, 660 feet north and west of the SE cor. of the SE of Section 82, Block 23, H.&G.N. Survey.

NORTH CENTRAL AND WEST TEXAS

Archer County

Moran Drilling Co. and Independent Oil & Gas Co.'s No. 1 S. L. Scott, 150 feet north and 2,335 feet west of the NE cor. of the M. Cartwright Survey, A-60, and located in the B.S.&F. Survey No. 2, A-1,205. J. B. Peacock's No. 1 J. M. Inman and others, 150 feet north and 450 feet west of the most easterly SE cor. of the Sarah McKimb Survey, A-493.

Brown County

Greene Production Co.'s No. 7 A. A. Moore, 500 feet south and 1,150 feet east of the NW cor. of the A. A. Moore tract out of the J. A. Belvin Survey, A-1,961. Bearman & Barbara Oil Co.'s No. 3 S. F. Miller, 800 feet north and 450 feet east of the SW cor. of the E half of the T. J. Swindell Survey, A-1,-171. Humble Oil & Refining Co.'s No. 22 J. T. Hodnett-A, 920 feet north and 2,200 feet east of the SW cor. of the heirs J. M. Harris Survey No. 784.

Christy-Breeding and others' No. 1 J. C. Jones, 150 feet south and 450 feet west of the NE cor. of the W half of Section 18, Juan Delgado Survey No. 785. Prairie Oil & Gas Co.'s No. 6 Mrs. A. Armstrong, 1,450 feet north and 450 feet east of the SW cor. of their 320-acre lease out of the H.&G.N. Survey No. 1, A-1,217. Moore Oil Corp.'s No. 1 F. H. Cross, 2,250 feet south and 375 feet west of the NE cor. of the R. Honeycutt Survey No. 623, being 150 feet south and east of the NW cor. of their 12.33-acre lease.

Humble Oil & Refining Co.'s No. 3 H. J. Ternooren, 150 feet north and 1,595 feet west of the SE cor. of the NW of Section 11, H.&T.C. Survey. J. H. Green & Co.'s No. 4 W. L. Hill, 450 feet south and 750 feet east of the NW cor. of the S. P. Walker Survey, A-992. G. W. McClung and others' No. 2 E. D. Davis, 1,340 feet south and 2,650 feet west of the NE cor. of Lot 43, Kerr County School Land No. 276. Prairie Oil & Gas Co.'s No. 3 J. P. Hargrove, 1,350 feet south and 1,826 feet west of the NE cor. of the J. P. Hargrove 114.5-acre tract out of the Moses Little Survey No. 40.

Callahan County

B. V. Blackwell and others' No. 1 R. O. Eubanks, 150 feet north and 750 feet east of the SW cor. of the NE of Section 48, Comal County School Land. Oyster & Rife's No. 1 W. Williams, 330 feet north and west of the SE cor. of the west 200 acres of the south 320 acres of Section 1, Block 1, S.P.R.R. Survey.

Coleman County

Magnolia Petroleum Co.'s No. 23 J. P. Morris, 1,800 feet south and 2,350 feet west of the NE cor. of the J. D. Davidson Survey No. 80. Texas Pacific Coal & Oil Co.'s No. 3 R. C. Gay, 150 feet south and 450 feet west of the NE cor. of the R. C. Gay 200-acre tract out of the Mary Ann Fisk Survey No. 630. Humphrey Brothers and Union Oil Co.'s No. 1 Sanger Brothers, 150 feet south and 1,950 feet west of the NE cor. of the Sanger Brothers 150-acre tract out of Section 61, H &T.B. Survey, A-424.

Cooke County

Pure Oil Co.'s No. 6 J. C. Ambry, 130 feet north and 420 feet east of the SW cor. of the T. J. Moss Survey, A-736. Kewanee Oil & Gas Co.'s No. 14 R. J. Timmis-A, 1,400 feet south and 475 feet west of the most easterly NE cor. of the E.T.R.R. Survey No. 5, A-363. Same company's No. 13 R. J. Timmis-A, 1,100 feet south and 484 feet west of the most easterly NE cor. of the E.T.R.R. Survey No. 5, A-363. Same company's No. 12 R. J. Timmis-A, 182 feet south and 438 feet east of the NW cor. of their 80-acre lease "A" out of the E.T.R.R. Survey No. 5, A-363. Lloyd Oil Corp.'s No. 1 D. B. Wheelock, 150 feet north and 810 feet west of the SE cor. of the C. Underwood Survey, A-1,073.

Crockett County

W. A. Moncrief and others' No. 1 R. Massie, 1,170 feet north and 1,320 feet east of the SW cor. of Section 47, Block UV, G.C.&S.F. Survey.

Eastland County

Goodwin and others' No. 3 J. V. and R. A. Parker, 910 feet north and 224 feet west of the SE cor. of the J. V. and R. A. Parker 25-acre tract out of the W. Van Norman Survey. J. M. Gholson and others' No. 2 C. V. Fox, 930 feet south and 150 feet west of the NE cor. of Section 28, McLennan County School Land, League 2. Jenkins and others' No. 1 R. A. Madding, 1,500 feet south and 1,050 feet west of the most northerly NE cor. of the S. J. Robinson Survey. J. A. Garner's No. 1 J. D. Fields, 390 feet south and 707 feet east of the NW cor. of Lot 4, J. Rubarth Survey. Kirk & Whitesides' No. 1 J. S. Turner, 150 feet north and 547 feet west of the SE cor. of the J. S. Turner 40-acre tract out of Section 30, Block 2, H.&T.C. Survey.

Erath County

Brown Drilling Co.'s No. 1 E. A. Davis, 240 feet south and 230 feet west of the NE cor. of the William Holland Survey, A-372. T. G. Shaw and others' No. 1 M. F. Cox, 300 feet south and east of the NW cor. of the M. F. Cox 45-acre tract out of the J. M. Espinosa Survey. H. J. Wickens' No. 1 W. E. Bandy, 1,-350 feet north and 2,900 feet east of the SW cor. of the William Johnson Survey No. 26, being 750 feet north and east of the SW cor. of the W. E. Bandy 116-acre tract.

Howard County

Cosden & Co.'s No. 4 Dora Roberts-C, 1,520 feet north and 200 feet west of the SE cor. of Section 128, Block 29, W.&N.W.R.R. Survey. Fuhrman Petroleum Corp.'s No. 1 H. C. Read, 2,310 feet north and 330 feet east of the SW cor. of Section 41, Block 32, T-1-N, T.&P. Survey.

Jones County

J. E. Breer's No. 1 J. C. Goodman, 150 feet north and east of the SW cor. of Section 15, Block 19, T.&P. Survey. Treat Oil & Gas Co.'s No. 1 S. L. Hodges, 750 feet south and 2,714 feet west of the

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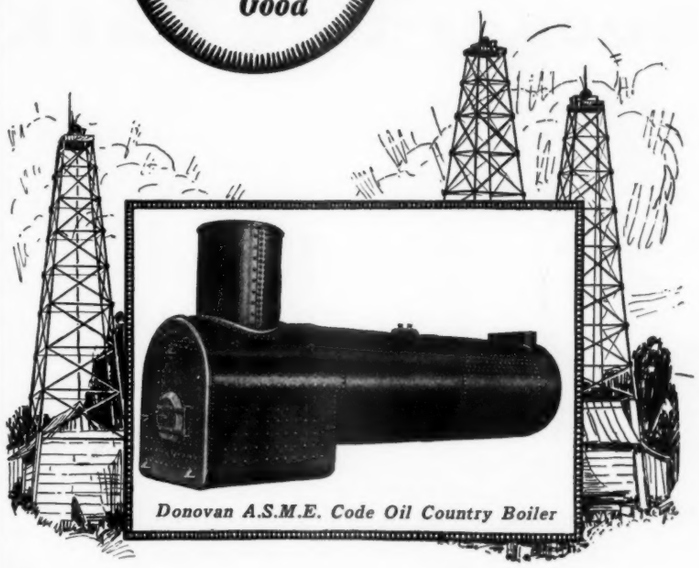

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The Lorraine Rod Rack prevents serious accidents and injury to workmen. It protects the rods against bending and kinking, with consequent weakening of the steel from these causes. It permits maximum speed when running-in or pulling out, cutting off-production time to minimum. It holds the rods in compact, orderly position—from the crown—out of the way, yet conveniently handy when wanted. Your savings in time and rods will quickly pay for it. Write for further and more detailed information.

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NE cor. of the S half of the A. Bell Survey No. 6, A-15. W. G. Clark and others' No. 1 E. Dickenson, 330 feet south and west of the NE cor. of the west 80 acres of the north 160 acres of the south 320 acres of the H. B. Williams Survey No. 273. Phillips Petroleum Co.'s No. 3 O. H. Pomeroy, 878 feet north and 330 feet east of the SW cor. of the O. H. Pomeroy 106-acre tract out of Section 16, Block 19, T.&P. Survey.

Grayson County

Simpson-Fell & Smith's No. 1 C. L. Owens, 1,600 feet south and 750 feet east of the NW cor. of the L. C. Hullett Survey, A-564.

Loving County

Lockhart & Co.'s No. 2 W. S. Hazell, 330 feet southwest of the northeast line and 330 feet northwest of the southeast line of Section 84, Block 33, H.&T.C. Survey.

Mitchell County

Ellis & Atlantic Oil Producing Co.'s No. 1 I. L. Ellwood, 660 feet north and east of the SW cor. of Section 30, Block 18, S.P.R.R. Survey.

H. H. Adams' No. 1 I. L. Ellwood, 1,170 feet north and 2,490 feet east of the SW cor. of Section 20, Block 18, S.P.R.R. Survey. The California Co.'s No. 2 J. W. Clark and others, Lease 2, 2,190 feet north and east of the SW cor. of Section 14, Block 28, T-1-N, T.&P. Survey.

Runnels County

Pure Oil Co.'s No. 2 R. R. Russell estate, 12,015 feet south and 945 feet east of the NW cor. of the James Hughes Survey No. 227. Same company's No. 1 R. R. Russell, estate, 12,231 feet south and 367 feet east of the NW cor. of the James Hughes Survey No. 227.

Montague County

P. Roberts and others' No. 1 W. B. Grimes, 150 feet north and east of the SW cor. of the L. Ramsey Survey No. 23, A-630.

Shackelford County

Midland Oil Co.'s No. 1 D. M. Proctor, 150 feet north and west of the SE cor. of the SW of Section 166, Block 10, E.T. R.R. Survey. Charles Wade's No. 1 J. T. Lannon, midway north and south and 150 feet east of the west line of the east 43 acres of the N. J. Whitfield Survey. Roeser & Pendleton's No. 1 W. I. Cook-A, Section 113, 220 feet north and west of the SE cor. of the NE of Section 113, Block 10, E.T.R.R. Survey. Tannehill and others' No. 2 L. H. Hill, 900 feet north and 450 feet east of the SW cor. of the SE of Section 2, Lunatic Asylum Land.

Tannehill and others' No. 1 E. E. Whitney, 1,200 feet northwest of the southeast line and 900 feet northeast of the southwest line of Section 802, T.E.&L. Survey. Ohio-Texas Oil Co.'s No. 2 J. B. Matthews-C, 450 feet south and 150 feet west of the NE cor. of the NW of the SW of Section 29, Block 10, E.T.R.R. Survey.

Stephens County

Lone Star Gas Co.'s No. 3 Ross Elliott, 2,203 feet south and 2,815 feet west of the NE cor. of Section 55, Block 7, T.&P. Survey. Same company's No. 4 Ross Elliott, 700 feet north and east of the most westerly SW cor. of Section 55, Block 7, T.&P. Survey.

Throckmorton County

F. C. Morton and others' No. 1 J. A. Matthews, 660 feet north and 2,037 feet west of the SE cor. of Section 227, Block 10, E.T.R.R. Survey.

Upton County

Humble Oil & Refining Co.'s No. 11 R. Ricker, 1,320 feet southwest of the northeast line and 5,390 feet southeast of the northwest line of Section 5, Mary S. Denton Survey, A-127. Sun Oil Co.'s No. 1 R. E. Long, 2,310 feet north and east of the SW cor. of Section 3, Rusk Transportation Co. Survey, A-356.

Wichita County

R. J. Brown's No. 1 Julian M. McFall, 150 feet south and west of the NE cor. of the south 200 acres of the north 400 acres of Section 3, B.B.B.&C. Survey, A-332. Madison Oil & Gas Co.'s No. 20 T. L. Burnett and others, 200 feet north and 150 feet east of the SW cor. of Section 7, H.&T.C Survey, A-134. Trinity Production Co.'s No. 14 S. B. Burnett and others, 150 feet north and 2,625 feet east of the SW cor. of Section 7, H.&T.B. Survey, A-134. Panhandle Refining Co.'s No. 2 T. L. Burnett and others-A, 150 feet north and west of the SE cor. of the NW of the SE of Section 6, S.A.&M.G. Survey, A-464. H. Hines' No. 3 T. L. Burnett and others-A, 150 feet south and west of the NE cor. of the SW of the SE of Section 6, S.A.&M.G. Survey, A-464. Panhandle Refining Co. and Ven-Mex Oil Co.'s No. 15 J. L. and T. J. Waggoner, 150 feet north and west of the SE cor. of Lot 9, Section 2, G.C.&S.F. Survey, A-772.

Winkler County

Southern Crude Oil Purchasing Co.'s No. 1 T. G. Hendricks T-88-R, 1,320 feet north and east of the SW cor. of Section 27, Block 26, School Land. Same company's No. 4 T. G. Hendricks T-88-O, 1,320 feet south and west of the NE cor. of Section 28, Block 26, School Land. Same company's No. 7 T. G. Hendricks T-88-K, 1,320 feet south and 1,650 feet west of the NE cor. of Section 41, Block 26, School Land. Same company's No. 8 T. G. Hendricks T-89-J, 440 feet north and 330 feet west of the SE cor. of Section 9, Block B-12, School Land.

Wilbarger County

Staley-Wynne & Co.'s No. 6 W. T. Waggoner-F, 150 feet south and east of the NW cor. of the SE of the SE of Section 32, Block 4, H.&T.C. Survey. Robertson & Grisham's No. 1 W. T. Waggoner, 150 feet south and west of the NE Cor. of Section 49, Block 4, H.&T.C. Survey. Lewis Production Co.'s No. 10 W. T. Waggoner, 150 feet south and 455 feet west of the NE cor. of the SW of the NE of Section 18, Block 4, H.&T.C. Survey. E. B. Lawson's No. 1 W. T. Waggoner-E, 150 feet north and west of the SE cor. of the NW of the SW of Section 7, Block 4, H.&T.C. Survey. Melat Oil Co.'s No. 5 W. T. Waggoner-A, 2,790 feet south and 704 feet west of the NE cor. of Section 10, Block 4, H.&T.C. Survey. Hammond & Mitcham's No. 1 W. T. Waggoner, 150 feet north and west of the SE cor. of the E half of the SE of Section 15, Block 4, H.&T.C. Survey. C. P. Burton's No. 1 W. T. Waggoner-L, 150 feet north and west of the SE cor. of Section 11, Block 4, H.&T.C. Survey.

Young County

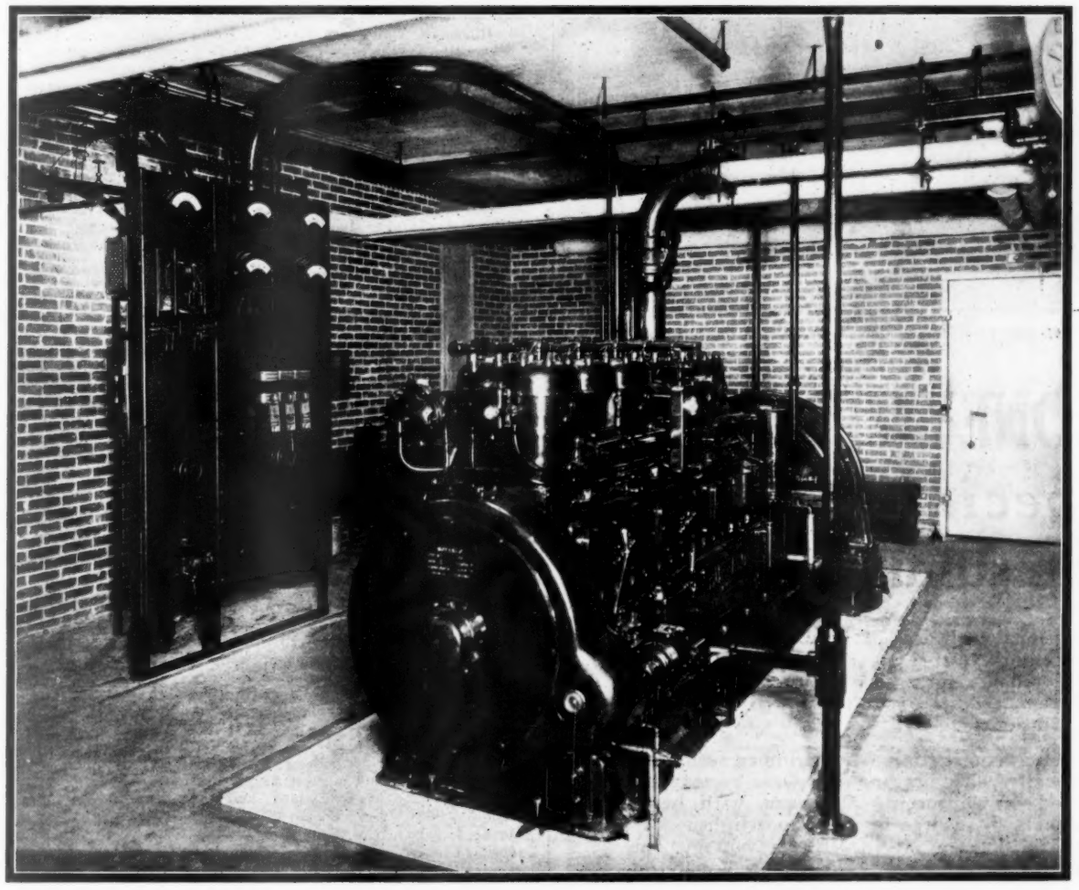
May-Camp Drilling Co.'s No. 1 H. O. and E. R. Prideaux, 450 feet south and 150 feet west of the NE cor. of the north 40 acres of Section 15, Young County School Land. Pannell and others' No. 5 R. J. Calvin, 450 feet south and 625 feet west of the NE cor. of the R. J. Calvin 200-acre tract out of the A. Rohus Survey, A-240. Riggs & Oliphant and others' No. 1 C. W. Langston, 150 feet south and east of the NW cor. of Section 1,490, T.E.&L. Survey. J. Bundy and others' No. 1 J. E. Brown, 150 feet south and east of the NW cor. of the south 213.5 acres of Section 1,368, T.E. &L. Survey. Lloyd Oil Corp.'s No. 1 J. S. Gregg, 300 feet north and east of the SW cor. of the NE of Section 1, Gal. Br. & Nav. Co. Survey, A-1,947.

Butler & McAllister's No. 1 J. K. Thomas, 1,437 feet north and 150 feet east of the SW cor. of Section 155, T. E.&L. Survey. Sun Oil Co.'s No. 1 M. E. Rogers, 950 feet south and 150 feet east of the NW cor. of Section 229, T.E.&L. Survey. Transcontinental Oil Co.'s No. 1 W. A. Corbett, 150 feet south and 360 feet west of the NE cor. of the Ruthy Campbell Survey, A-2,297. Scott & Nance's No. 1 T. M. and D. A. McBrayer, 150 feet south and 800 feet east of the NW cor. of the J. M. James Survey, A-1,329.

Corrections

Brown County—M. T. Anderson's No. 2 A. Leatherwood, 1,600 feet south and 200 feet east of the NW cor. of the E half of the south 143 acres of Section 11, Juan Delgado Survey No. 785. Hart & Cole, Inc.'s No. 1 E. L. Dixon, 275 feet southwest of the northeast line and 1,770 feet northwest of the southeast line of the E. L. Dixon 172.5-acre tract out of the J. Grant Survey No. 136. George W. McClung and others' No. 1 E. D. Davis, 1,340 feet south and 1,050 feet west of

Buffalo



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An Ideal Auxiliary Engine for Pipe Line Service, Gas Compressor and Oil Pumping Stations

High over-all efficiency; gas consumption being less than 9 cu. ft. per B. H. P. hour at full load.

This engine is heavily constructed for continuous service. Can be converted for gasoline operation when gas supply becomes inadequate.

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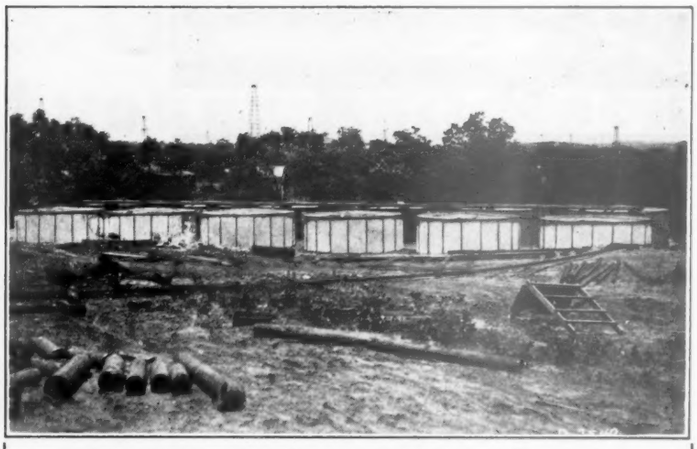

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The exceptional tightness of MALONEY Tanks is a money-saving feature at all times. But it is *especially* valuable during the weather when evaporation works hardest to cut the gravity of stored petroleum products.

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Distributers at All Principal Petroleum Points

Sizes: 12 to 10,000 Barrels

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Howell Aluminum "4-in-1" Vacuum Pressure Valve and Thief-Hatch—The BEST and LATEST Deck Equipment—POSITIVE Safety.

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ALONE

the NE cor. of Section 43, Kerr County School Land No. 276.

Coleman County—Eastland Oil Co.'s No. 1 Isaac Keeney, 250 feet north and 450 feet east of the SW cor. of the north 94 acres of the west 194 acres of the I. Keeney 374.84-acre tract out of the R. Cochran Survey No. 269. E. J. Hunter's No. 1 W. L. Baugh, 150 feet north and 1,755 feet west of the SE cor. of Lot 5, of the R. Perry Survey No. 95.

Pecos County—Buell & Hagan's No. 1 University Land-B, 330 feet north and 660 feet west of the SE cor. of Section 36, Block 18, University Land.

Shackelford County—Grisham-Hunter Corp.'s No. 1 G. R. Davis, 150 feet north and east of the SW cor. of the W half of the SE of Section 17, Block 13, T.&P. Survey.

Stephens County—W. M. McLaran and others' No. 1 R. W. Jackson, 1,100 feet north and 900 feet east of the SW cor. of the SE of Section 44, Block 6, T.&P. Survey.

Wichita County—John W. Caldwell's No. 13 Allen & Kemp, 200 feet south and 150 feet east of the NW cor. of the S half of Lot 10, Block 26, Kemp Wichita Valley Land. Same company's No. 14 Allen & Kemp, 500 feet south and 150 feet east of the NW cor. of the S half of Lot 10, Block 26, Kemp Wichita Valley Land.

Young County—O. Bratcher's No. 6 J. C. C. Edwards, 1,050 feet south and 450 feet west of the NE cor. of the J. C. C. Edwards 100-acre tract out of the S. Tynes Survey, A-274.

MEXICAN DEPARTMENT REPORTS ON OPERATIONS

MEXICO CITY, Mexico, Apr. 16.—(By Trens Agency)—The petroleum bureau of the Department of Industry, Commerce and Labor, issued a review of petroleum activities which states that during the month ending March 15, 12 wells were brought in as producers with a combined capacity of 5,459 bbls. Nine are in the River Panuco Pool, one in that of Tuxpan and two in that of the Isthmus of Tehuantepec. Reference is made particularly to Nos. 7 and 10 Tonala of the Mexican Petroleum Co. "El Aguila." The first has a producing capacity of 1,000 bbls. and the second 2,000 bbls. Tonala is in the northeast part of the Isthmus of Tehuantepec, near the River Tonala which separates the State of Vera Cruz from Tabasco. The productive area has been enlarged so that it measures 1,400 meters from east to west and 800 meters from north to south, the petroleum being of the best quality.

The total number of producing wells brought in during the present year is 26 with a total capacity of 14,472 bbls. These wells are distributed as follows:

Zones—	No. of Wells	Initial daily prod. bbls.
Cacalilao (Panuco)	5	1,402
Panuco (various)	8	1,963
Topila	4	1,635
Cincuenta	1	63
Alamo	2	1,503
Paso Real	1	3,994
Furbero	1	75
Tonala (Isthmus)	3	4,648
Filisola (Isthmus)	1	88
Total	26	14,472

Work was being done in the following camps: Cardiel, Kicotencatl and San Francisco of the district of the South of Tamaulipas; Corcovado, Salinas, Chapacao, Cacalilao, Panuco, Carocol, Tamante and Tamboyoche in the River Panuco Pool; Cincuenta and Tanguijo to the south of the Laguna de Tamiahua; Chinampa, Toteco, Tierra Amarillo, Jardin, Paso Real and San Isidro pertaining to the Faca de Oro; El Ixtle, to the west of the Faca de Oro; Zapotal, Miahuapan and Mecatepec, in the part south of Tuxpan; Furbero and Posa Rica, to the south of the River Cazones; Chinameca, Tonala, Teapa, Acalapa, Punta Gorda, Santa Rosa, Filisola and Pedregal, on the Isthmus of Tehuantepec; Belam, in the State of Tabasco; and Otumba in the north of the Valley of Mexico.

Some 55 wells were being drilled, the greater part in the River Panuco Pool and on the Isthmus of Tehuantepec.

The greatest activity is being shown at the present moment on the Isthmus of Tehuantepec, where the Mexican Petroleum Co. "El Aguila" is carrying on an extensive plan. In the other parts of the country explorations continue more or less actively; but no program for drilling is yet defined by the big companies, nor, in general, any exploration plan, and it is possible that there will be no increase of activity on their part and that they will maintain the same condition as in 1928. The general explanation given is that these companies are interested in a policy of restriction of world production.

Some companies are systematically continuing their exploration work which embraces the country from the northern frontier to the regions of Tabasco and Chiapas in the southeast.

During the present year the department has authorized 85 drilling permits, the greatest part for drilling in the River Panuco Pool. Of these permissions 39 were granted in January, 29 in February and 17 in the first 10 days of March. The following are worth mentioning, in particular:

Wells Nos. 1, 2 and 3 Gonzales Trevino on the northern frontier pertaining to the municipality of Jimenez, District of Rio Grande and a little more than 20 kilometers to the west of the frontier town of Villa Acuna, in lands which have been considered as possibly oil producing. These wells will be drilled by the Ohio Mexico Oil Corp.

Well No. 1 Rusias, of the Mexico Texas Petrolene & Asphalt Co., in the northern part of the Gulf of Mexico belonging to the hacienda of San Jose de las Rusias, Municipality of Soto la Marina y Aldama, of the central part of the State of Tamaulipas. The well is in the western slope of the San Jose de las Rusias ridge, to the southeast of the village of the same name, and 40 kilometers to the southeast of Soto la Marina sand bank.

The Huimanguillo No. 1 well, of Jones & Co., in the municipality of Huimanguillo, State of Tabasco, near the River Tancochapa, which forms part of the boundary line between the States of Tabasco and Vera Cruz. It is 13 kilometers north of the Tecuanapa petroleum camp which, about 20 years ago, commenced to be exploited by the Mexican Petroleum Co. "El Aguila."

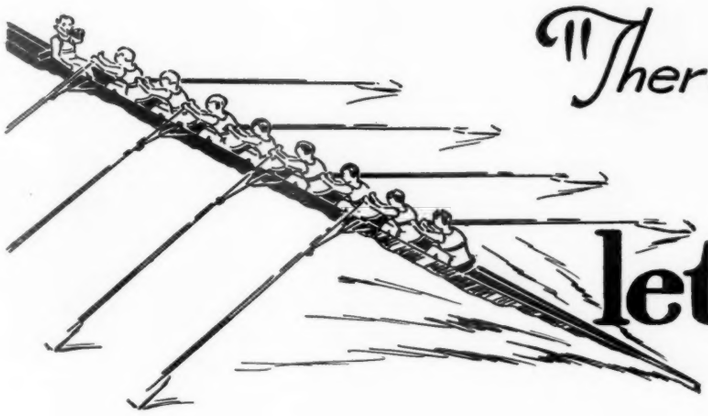
Well No. 1 belonging to J. Pohlenz in the Valley of Mexico in Reyes Acozac lands, municipality of Tecomac, Otumba in the State of Mexico, a short distance from kilometer 44 on the highway which unites the City of Mexico with that of Pachuca. The sinking of this well is being continued. Whatever may be the results valuable geological lessons will be learned concerning this part of the Mexican valley.

Work of a similar nature, previously authorized, is being conducted in diverse regions of the Gulf Coast and are being followed with great interest, no drilling work having been undertaken in them before. Among these may be mentioned those being conducted in the southern part of the State of Tamaulipas, stretching from the agricultural district of Xicotencatl to the River Tamesi, and those which the National Petroleum Control is carrying out on the hacienda of Ixtle, in the district of Tuxpan, to the west of the Faca de Oro and not far from the oil camps of Juan Felipe, Alazan and Potrero del Llano.

The Mexican petroleum production in January reached a total of 3,514,969 bbls. with a commercial value of 7,329,645 Mexican gold pesos. Of this production 1,797,487 bbls. were heavy crude oil and 1,717,422 bbls. were light crude oil. Including this production the total Mexico output since 1901 until January 31 of this year totaled 1,518,713,958 bbls. with a commercial value of 2,736,744,102 Mexican gold pesos.

Mexican petroleum exports in January were 1,895,327 bbls., and in February 1,265,957 bbls.

Mexican export of petroleum products in January were 8,327 bbls., and in February 89,224 bbls.



"There must be No let-downs"

The steady rhythmic sweep of the oarsmen—magnificent specimens of splendidly trained physical manhood—pulling in perfect unison to gain a glorious victory. Here is no room for the shirker. Success depends upon every ounce of individual effort co-ordinated into a unified whole.

Likewise, in Industry, there must be no let downs. Production schedules must be maintained — machinery must be kept running—time out for delays is costly.

To insure this uninterrupted operation, much depends upon the valves used to control the flow of steam, oil, gas, liquids, etc.

The well-managed plant has no place for duty-shirking valves which continually let down under the steady grind and cause endless trouble and expense. Each and every valve must do its proportionate share to secure the maximum degree of satisfactory service. Ultimate low cost over long periods of time rather than first cost is the real measure of value.

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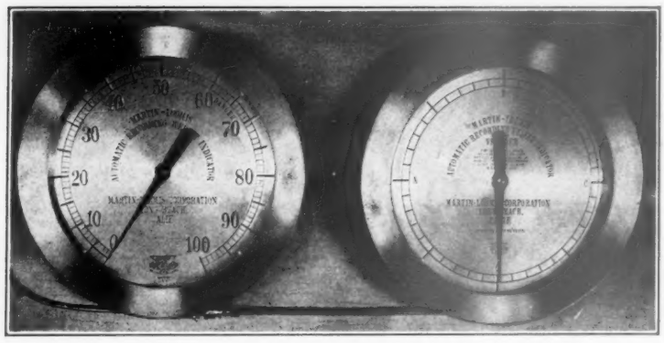

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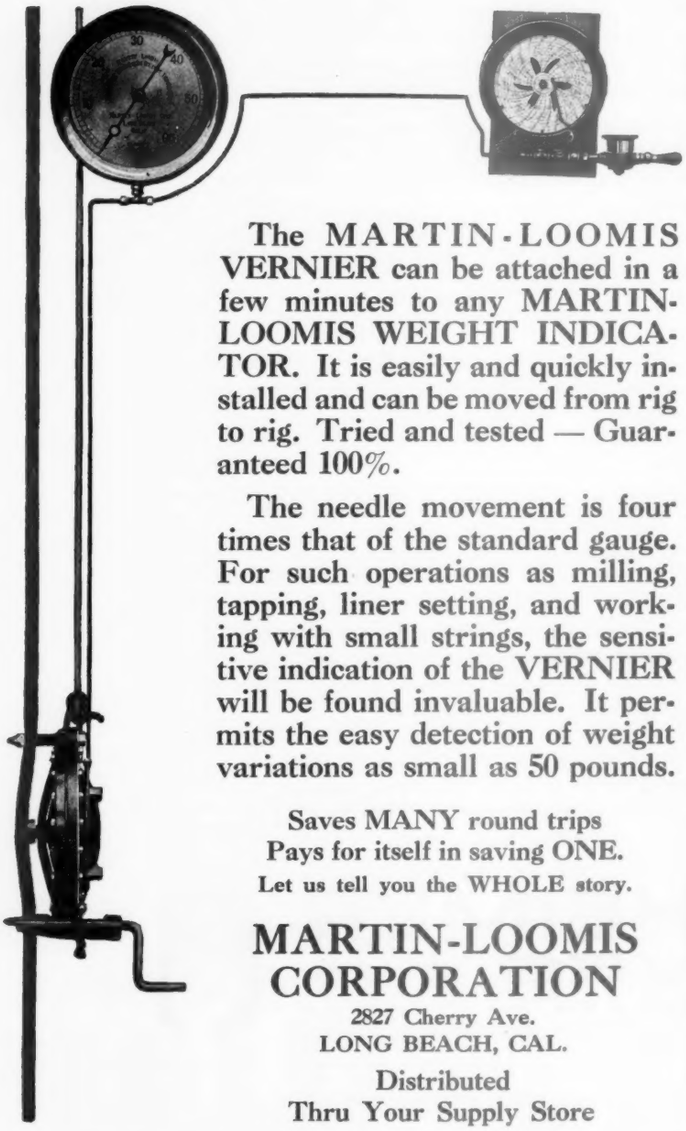
DELICATE FISHING JOBS



The MARTIN-LOOMIS VERNIER can be attached in a few minutes to any MARTIN-LOOMIS WEIGHT INDICATOR. It is easily and quickly installed and can be moved from rig to rig. Tried and tested — Guaranteed 100%.

The needle movement is four times that of the standard gauge. For such operations as milling, tapping, liner setting, and working with small strings, the sensitive indication of the VERNIER will be found invaluable. It permits the easy detection of weight variations as small as 50 pounds.

Saves MANY round trips
Pays for itself in saving ONE.
Let us tell you the WHOLE story.

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Distributed
Thru Your Supply Store

WEIGHT RECORDING, MEASUREMENT AND CONTROL

UNDERGROUND SURVEYS MADE OF OIL WELLS

(Continued from Page 107)

survey stopped was already many hundreds of feet outside the limits of the field.

A graphic illustration of the figures of column C of Table 3 is presented in Figure 1. The increase of inclination with depth shown in the maximum column is interesting, but should not be interpreted without some further explanation.

In compiling Table 3, it so happened that the maximum inclination at each listed depth provided the logical-looking sequence so easily grasped by inspection of Figure 1. But it should be noted that, in a considerable number of cases, wells, which were finished at intermediate points between the seven listed depths, attained very much larger inclinations than the table happens to indicate; in several cases wells finished between the depths of 3,000 and 6,000 feet attained an inclination of 50 degrees or more.

Influence of Bad Wells on Table 3

A certain proportion of the surveys of Table 3 were made to investigate wells

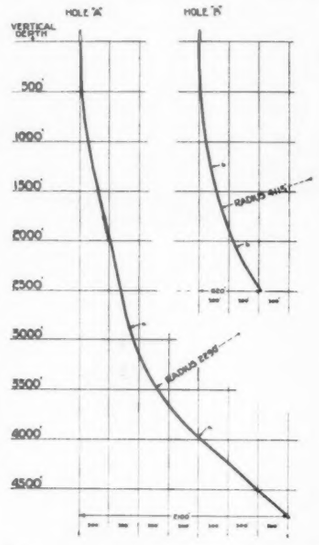

Figure 4.—Vertical projections of two rotary holes with large drift.

which had proven disappointing. Most of the disappointing results were due to excessive drift of the holes.

Owing to the inclusion of an undue proportion of bad wells, the averages shown in Table 3, both for drift and inclination, are probably about 25 per cent greater than the true averages that might be expected from a similar number of wells chosen at random in the same fields, and drilled at about the same date.

In spite of the fact that the averages of Table 3 are higher than normal for the particular fields from which they were drawn,[1] there are fields in California where the average drift is probably greater than the average of Table 3, and there are yet other fields where the drift is undoubtedly a good deal less.

Loss in Vertical Depth Caused by Drift

Table 4 was compiled from the same wells as Table 3, and includes a similar footage of rotary hole.

To make Table 4 strictly comparable with Table 3, the difference between the measured depth and vertical depth of each well at 1,000, 2,000, 3,000 feet, etc., should have been tabulated, but this was not done. In compiling Table 4, only the difference at bottom between the measured depth and the vertical depth of each well was taken.

It will be noted that the average loss in depth of wells finished between 3,000 feet and 4,000 feet is 39.8 feet as compared with 38.4 feet in the wells finished between 4,000 feet and 5,000 feet. The apparent contradiction in these figures is due to the influence of a few wells of exceptionally large drift finished between 3,000 feet and 4,000 feet.

Relation Between Drift and Depth

Table 1 shows the relation between the three sides of a right-angle triangle in which the hypothenuse represents a portion of an inclined hole.

Without the assistance of a table of this kind, it is not easy to realize the simple facts shown in it; for instance,

Figure 5.

when a well is drifting horizontally 90.6 feet with each 100 feet drilled, it is still making a vertical penetration of 42.3 feet.

The drift of a well is not necessarily indicative of its vertical depth. A deep well may attain a considerable drift because it reaches an inclination such as 5 degrees a few hundred feet below the derrick floor and continues to have approximately the same inclination to bottom. Another well may remain nearly vertical to a much greater depth and may then attain a similar drift because a part of the hole near bottom has a high inclination. The figures of Table 1 show that a well with a uniform inclination of 5 degrees will only lose vertical depth at the rate of 0.4 feet per 100 feet of measured depth, whereas, a part of a well with an inclination of 30 degrees loses 13.4 feet per 100. The loss in vertical depth in 100 feet of hole, which is inclined at 30 degrees from the vertical is, therefore, equivalent to the loss in vertical depth of 3,350 feet of hole which is inclined at 5 degrees from the vertical.

Influence of Loss in Vertical Depth on Correlations

Taking an extreme case from Table 4 where one well is shown to have lost 335 feet in vertical depth at a measured depth between 3,000 and 4,000 feet, it is evident that any correlation based on the assumption that the measured depth of the well corresponded to its vertical depth would usually be at least 335 feet out. However, in most cases, the error in correlation would generally be very much greater than 335 feet because, to attain a loss of 335 feet in depth, this well drifted 966 feet from the vertical. For purposes of correct correlation, the position of the bottom of the hole must be taken into account and, if a deepening or redrilling job is being considered, the inclination and direction of the hole at bottom are also important factors.

Curvature of Rotary Holes

Severe kinks and bad places, where a sudden large change in inclination takes place in a rotary hole, are occasionally shown by a survey. To bring out the full detail of these parts, survey readings must be taken at short intervals.

The most interesting features of curvature in rotary holes are, however, the moderate and continued bends which are mainly responsible for developing great drift and inclination in wells.

The holes "A" and "B" shown in Figure 4 are holes of large drift, and neither of them shows any large change in direction of drift.

Each of these wells was projected on to a vertical plane which included the mouth and the bottom of the hole: the projections are, therefore, practically exact facsimiles of the hole.

In each of these wells there is a portion of the hole, a-a in hole "A" and b-b in hole "B," in which the curvature is constant; each of these parts is, therefore, a segment of a circle.

The radius of the part a-a of hole "A"

[1] 70 per cent of the footage of this table was surveyed in the Signal Hill Field, Los Angeles County, California.

ONE OF A DOZEN

BUTLER
TRUCK TANKS

Butler Truck Tanks have a reputation for following one another into the service of hundreds of oil companies. It is not unusual to find entire tank truck fleets Butler equipped. And the number of fleets, wherein Butler's are the preferred truck tanks, is legion.

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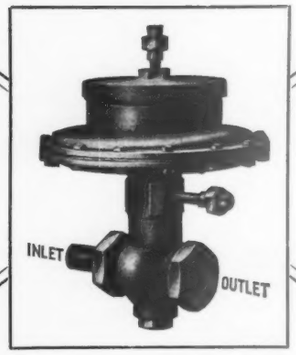

An unusually sensitive, frictionless and long lasting governor to be used either as a district governor or for individual service. Maintains a uniform pressure throughout the entire range of flow.

The Chaplin-Fulton Mfg. Co.
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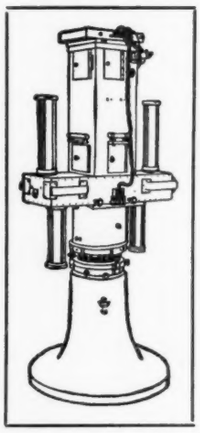

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TABLE NO. 3—DRIFT AND INCLINATION OF OIL WELLS

Some Data from Underground Surveys of 255 Rotary Drilled Holes, Mainly in California—1,158,542 Feet of Hole and 13,150 Individual Survey Readings

No. of holes	(A) Depth in feet	(B) Horizontal distance from mouth to bottom of hole (in feet) Max.	Min.	Ave.	(C) Inclination of hole from vertical (in deg. and ft. per 100) Max.	Min.	Ave.	(D) Amount of drift from vertical (in feet) Max.	Min.	Ave.
255	500	37	0	8.7	8° 20′ 14.5 ft. per 100	0° 00′	2° 09′ 3.8 ft. per 100	114	0	10.6
255	1,000	131	2	30.2	15° 30′ 26.7 ft. per 100	0° 00′	3° 05′ 5.4 ft. per 100	131	0	34.4
243	2,000	455	9	89.2	34° 15′ 56.3 ft. per 100	0° 10′ 0.3 ft. per 100	4° 05′ 7.1 ft. per 100	457	1.5	104.5
219	3,000	845	9	119.5	32° 15′ 53.4 ft. per 100	0° 30′ 0.9 ft. per 100	6° 42′ 11.7 ft. per 100	850	47.0	204.9
163	4,000	1,036	6	236.5	40° 15′ 64.6 ft. per 100	0° 30′ 0.9 ft. per 100	9° 00′ 15.6 ft. per 100	1,285	77.6	307.7
104	5,000	1,752	29	396.8	52° 00′ 78.8 ft. per 100	0° 30′ 0.9 ft. per 100	15° 44′ 27.2 ft. per 100	1,815	91.0	515.9
38	6,000	2,200	74	589.4	65° 15′ 90.8 ft. per 100	2° 30′ 4.4 ft. per 100	22° 25′ 38.1 ft. per 100	2,228	357.0	793.1

Explanation of terms:
"B" is the horizontal distance between a vertical line through the mouth of the hole and a vertical line to the hole at the listed depth.
"C" is the inclination from vertical at the listed depth.
"D" is the total drift from vertical down to the listed depth.
In the case of a well drifting in the same direction from mouth to bottom, "B" and "D" would be equal.

is 2,290 feet, and the radius of the part b-b of hole "B" is 4,115 feet. Tht curvature of the part a-a of hole "A" is equivalent to a rise R of 1.08 inches (0.09 feet) in a length of 40 feet, or say a length equivalent to about two joints of drill pipe. The great drift of hole "A" is mainly due to the increase in inclination which takes place in the part of the hole a-a. Below the part a-a the inclination remains nearly constant. In hole "B" the curvature of the part b-b also plays an important part. The radius of this segment is 4,115 feet and the rise in a 40-foot length of hole is, therefore, 0.6 inches (0.05 feet). Figure 3 is a diagram, the curvature of the holes being too slight to make an effective scale drawing.

Holes "A" and "B" are examples of wells which are in perfect mechanical condition, and which have no severe bends, kinks or bad places in them. The inclinations and drifts attained by both of these wells are due to continued slight increase in inclination. To their driller, both of these wells appeared to be perfect, and neither of them gave any indication of drift or curvature to the men on the derrick floor.

Figure 2 is a scale drawing showing a length of 6-inch drill pipe inside a hole 15 inches in diameter. The diameter of the tool joints is 7¾ inches.

When a tool joint is resting against one side of the hole, as for instance, the tool joint at the top of the first joint of pipe above the drill collar in Figure 2, the space between the 7¾-inch diameter tool joint and the wall of the 15-inch diameter hole is 7¼ inches.

Why is the curvature of Hole A only 1.08 inches in 40 feet of hole when a very much larger space between the tool joints and the wall of the hole is available? In Figure 2 the free space between the wall of the hole and the tool joint is seen to be 7¼ inches and, although the dimensions of Figure 2 are probably not the same as the relative dimensions between hole diameter and drill pipe in Hole A, it is obvious that the space available in Hole A was much greater than that utilized in the curvature of the hole.

The greatest continuous curvature that the writer has observed in a rotary hole amounted to 1.44 inches (0.12 feet) in a length of 40 feet of hole. This is approximately equivalent to an increase in inclination of 1 degree with each 30 feet of hole or, say, an increase in inclination of 3 degrees per 90-foot stand of pipe.

Apparently, the relative proportions of the diameter of the tool joints and drill pipe is not the only factor, or even the most important factor in the determination of the curvature of a rotary hole.

When weight is placed on the drill bit in a vertical hole, the drill pipe is obviously cramped down in the hole and each tool joint finds support against the walls of the hole. When drilling commences, it seems probable that the drill pipe is wrapped around the interior of the hole in a spiral form and that the spiral rotates as a whole and, at the same time, the pipe itself rotates.

TABLE 4—LOSS IN VERTICAL DEPTH CAUSED BY DRIFT IN ROTARY HOLES

Measured depth in feet—	Loss in vertical depth in feet Max.	Min.	Ave.
1,000 to 2,000	20	0.7	3.4
2,000 to 3,000	130	1.0	29.4
3,000 to 4,000	335	0.6	39.8
4,000 to 5,000	370	4.0	38.4
5,000 to 6,000	542	7.0	115.6
Over 6,000	620	6.0	169.7

Occasionally, a fishtail bit will become flattened against the side of the hole and the rotation of the pipe itself will be stopped while the rotation of the pipe as a spiral will continue.

When the above occurs, the fishtail bit will cut an annular hole, leaving a core standing up in the center of the hole. The outside of the bit soon becomes ground away to a segment of a circle and the projecting core wears a groove in the inner side of the bit. (See Figure 5.)

Drilling cannot, of course, continue with the bit in this position: a twist-off will soon take place. This incident is mentioned here because it proves a case of spiral rotation of the drill pipe.

Suggested Influence of Torsion in the Drill Pipe on Curvature of Rotary Tools

It is commonly stated that the drill pipe sags down onto the lower side of an inclined hole and thus raises the end of the bit to make the hole go farther and farther out of vertical.

The writer suggests that the drill pipe tends to have a spiral form and that this spiral, as a whole, rotates like an attenuated corkscrew within the hole and that the pipe, therefore, does not lie in the bottom of the hole.

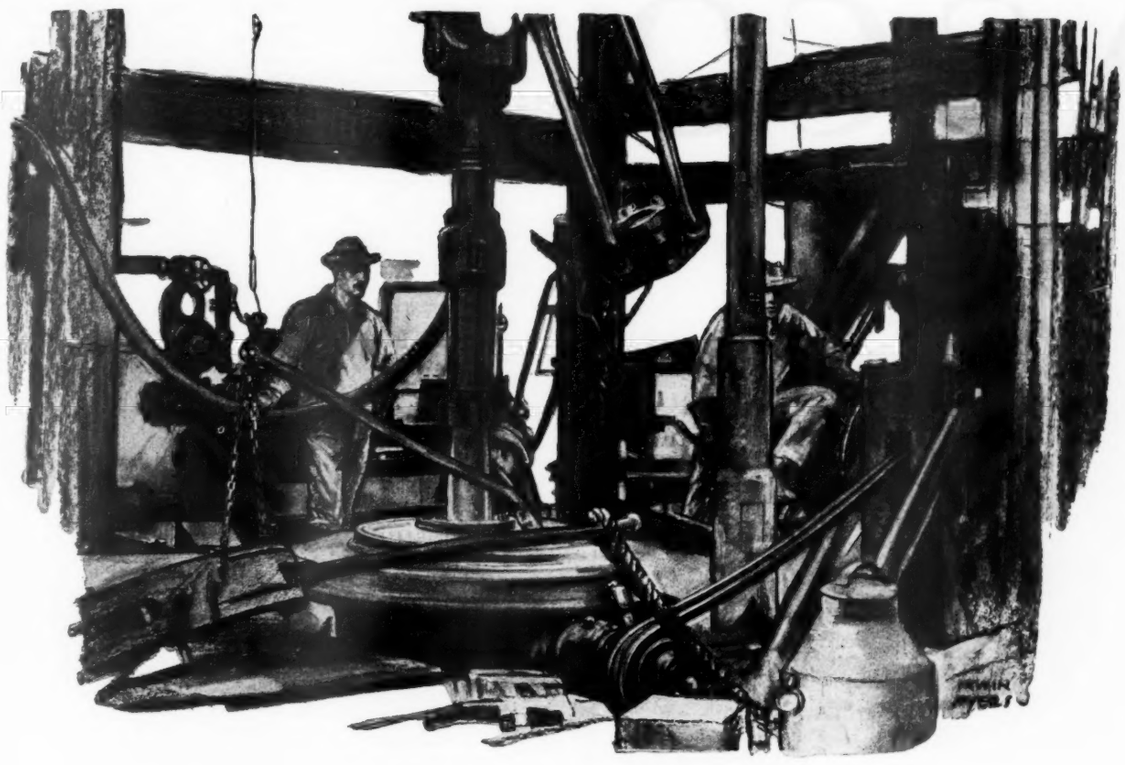
If the above suggestion is true, it may help to explain why the usual curvatures found in rotary holes are so very much more moderate than they might be expected to be if the pipe lay in the lower side of the hole.

Direction of Drift of Rotary Holes Relative to the Dip of the Strata

Where the dip of the strata does not exceed 10 degrees, it has been noticed that, at least in some fields, there is a tendency for wells to butt into the structure. Sometimes, for this reason, a well may end up several hundred feet higher on the structure than the position of the derrick would indicate.

Instances of wells butting into the structure have been found even when the dip was known to be 60 degrees and very interesting geologic information has been obtained from cores taken from wells of this kind which traveled into and across a structure at a very flat inclination.

As the dip of the strata gets higher, the proportion of wells which butt into



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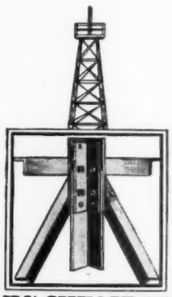

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the structure usually becomes smaller. Where the dip is around 25 degrees, a good many wells may follow the direction of the strike and a good many may follow a general down dip direction.

When not too near the edge of the field, a carefully drilled downdip well may make a good producer, but if one of these wells is carelessly drilled, it will frequently be forced completely out of the field and cores taken from such a well may show vertical striation because the well has become parallel with the strata.

When a hole starts to drift off structure and attains a considerable inclination from vertical a few hundred feet below the derrick floor, it is usual to find that the direction of the drift is maintained. The plan view of a well of this kind is generally very nearly a straight line, and the drift is frequently enormous.

Wells, which start out with a drift along the strike, often change direction and may either butt into the structure or run down dip. In some parts of certain fields, adjoining wells show very similar inclinations and directions of drift. In these localities, redrilling may succeed in lessening the amount of drift but is apt to fail to materially alter the direction of drift.

In other parts of the field there may be a critical depth at which a well will either make a change of direction up or down structure. Under such conditions, when the hole is redrilled from the critical depth, it may take a more favorable direction and a good producer is often obtained from a previously hopeless hole.

TABLE 5—SURVEY DATA ON WELL "A"

Reading number	Measured depth in feet	Vertical depth in feet	Inclination from vertical	Direction of inclination	Total drift from vertical in feet
7	551	549	8° 40′	S 48° 48′ E	38.06
12	993	985	9° 10′	S 31° 54′ E	109.60
24	2,057	2,019	14° 00′	S 19° 40′ E	359.30
35	3,033	2,968	16° 00′	S 18° 28′ E	589.19
46	4,008	3,807	40° 00′	S 3° 23′ W	1,015.51
57	4,983	4,454	46° 00′	S 8° 18′ W	1,805.56
62	5,379	4,713	48° 00′	S 6° 52′ W	2,100.00

Table 5 gives 7 of the 62 survey readings which were taken in Well "A" of Figure 4.

RELATIONSHIP OF OIL TO THE GOVERNMENT

(Continued from Page 86)

right to prevent an adjacent owner, who desired to drill and produce wells, from draining the oil from below his property. Every oil producer will recognize that that right does not exist under our present system. One might conclude that the oil business is operating under a system of underground rights that is not in keeping with the principle that the owner of the surface is the owner of the right to the minerals below his surface. Certainly some modification of that principle has occurred.

Modified by Courts

The character of that modification is clearly indicated by the words of a Pennsylvania judge in giving his decision on a case involving the ownership of gas in 1889:

"Possession of the land, therefore, is not necessarily possession of the gas. If an adjoining, or even distant, owner, drills on his land and taps your gas, so that it comes into his well and under his control, it is no longer yours, but his."

This opinion was not the view solely of the judge who rendered it but the common view of practically all oil men in Pennsylvania. It may be considered as merely a formal pronouncement of a principle that had been steadily gaining strength from the date of the original discovery of oil in 1859. While lack of knowledge of the nature of both oil and gas and the reservoirs in which they were found led oil men and jurists to curious methods of reasoning and wholly erroneous explanations of the causes, no one questioned their elusive character and the essential difference between them and such mineral substances as coal. Attempts to apply the principles used so successfully in coal mining met with no support whatever. From the very beginning, the oil and gas industries of the United States have built their practices upon the principle that ownership of the surface gives the right to drill and to produce as the owner sees fit even if oil and gas are drawn from other properties. The owner of the surface may be defined as the owner of the right to produce any oil or gas that may come into his wells.

Offset Drilling

Many of the ills of the oil and gas industries have been laid to this principle. The only protection against loss of oil or gas to the wells drilled on a neighbor's property is that of drilling offset wells. Another Pennsylvania judge in pointing out the results of the application of this principle in 1907 said, "This may not be the best rule, but neither the Legislature nor our highest court have given us any better." While the acceptance of the principle has led to many offset drilling campaigns, the sinking of thousands of costly and frequently unnecessary wells, and periods of overproduction and low prices, it is not without merit. It is simple. In general it rewards the discoverer and the energetic driller and penalizes the laggard. It has been successful in preventing litigation, a thing that no law supporting the principle of ownership in situ or in place could have done in the oil or gas field.

Despite this there are some who declare that the principle of ownership through reduction to possession is alien to our system of ownership and would have the laws changed to make the owner of the surface the absolute owner of the oil and gas imprisoned below his land just as he is the owner of the coal, limestone or gypsum. It is true that this principle is of comparatively recent development and does depart from the general principle. One would be inclined to feel the justice of this view more if this were the only deviation from the letter of the major principle. However, this is not the case. Deposits of coal, limestone, clay, gypsum and related solid substances commonly occur in beds of limited thickness but great horizontal extent. Many of these may be found by test drills to underlie thousands of acres. The application of the principle of vertical boundaries can be made without difficulty. On the other hand, gold, silver, tin and copper are generally found in vein-like bodies extending downward for an indefinite distance. Such veins are frequently of considerable length horizontally but seldom attain great width. Some are practically vertical, others are inclined at angles of 20, 30, 40 or 50 degrees from the vertical.

The Apex Law

It is evident that if a vein which is practically vertical is discovered on a man's property he has the right according to the old English principle to mine to an indefinite depth. What rights would he have if the vein that outcrops on his property passes beneath the property of his neighbors because of its inclination? This question was asked and answered in 1287, when Edward I of England confirmed the rights of miners to remove ore from beneath neighboring lands in following the course of veins that they had discovered on the surface of their own properties. This is known as the apex law, the apex of the vein being considered to be the line of its outcrop or the portion which reaches nearest to the surface if the vein is entirely below the surface.

The law was originally intended to guarantee to the discoverer of a vein the right to work that vein without the fear that after work had begun the vein would pass under the property lines of another and cease to be usable to its discoverer. As long as mining was a simple industry, the law was very successful. However, as exploration was carried on at great depths and as numbers of veins crossing each other were encountered in

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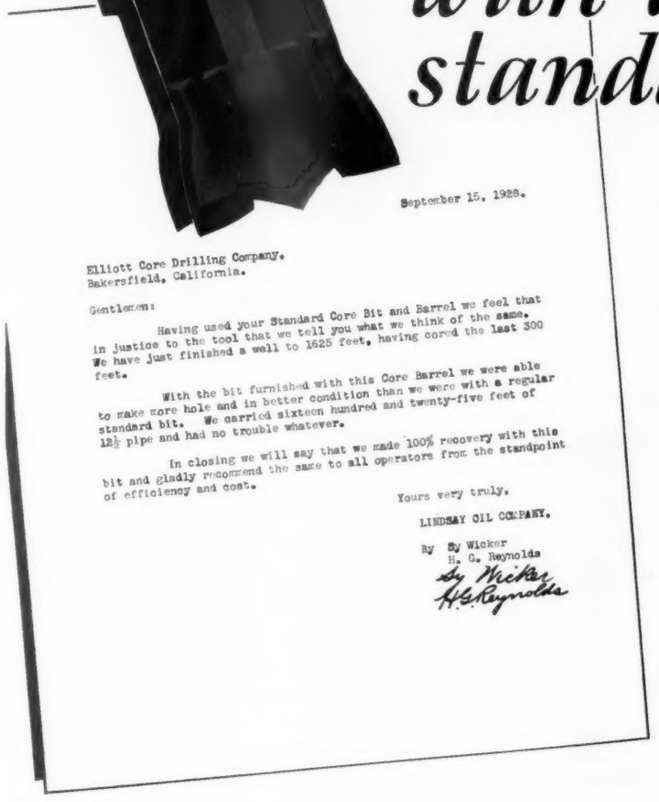

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some areas, the problem of determining the true apex and thus, where several companies or individuals were mining ore bodies that had been discovered on adjacent claims, the true owner of a given ore body became most difficult. "Apex litigation" has proved a curse to many of the most famous mining centers of this country. Many suits over the rights to mine rich ores were not settled until all of the profits had been consumed by the costs of the litigation.

In many of the less developed countries and those in which the theory of state ownership of all mineral rights prevailed, the apex law was abandoned or greatly modified and the principle of vertical limitation of boundaries restored. Despite the fact that litigation within this country has undoubtedly cost more than that in any other nation and the most strenuous efforts to have the apex system of ownership of veins abolished, it is more deeply entrenched in our system of mining law than ever before. It is supported by a long line of court decisions which give precedents for the handling of the most complicated cases.

Change Would Be Difficult

While originally the apex law served to protect and reward the discoverer and developer of a new deposit, it would be difficult to prove that it does this in every case today. The number of cases cited by books on mining law would indicate that it has fallen far short of complete success. However, there is no reason to anticipate that the system will be materially changed in the future. In a country such as ours precedent exerts a great deal of influence toward retaining the old rules and systems. There is no reason to expect that the system that limits the rights of the individual to the drilling of wells and the ownership of the oil and gas that he can reduce to his possession will be less resistant to the direct attacks of those who would modify it than the apex system has been to those who have attacked it. Certainly so vital a change could not be made in a period of a few months or even in several years. The American system of oil and gas rights is a system that distinctly modifies the principle that the minerals belong entirely to the owner of the surface under which they lie. However, it is a modification that came into existence because the older rulings contained no precedent that was applicable to the mobile oil and gas; it has grown stronger with time as the only just method of rewarding the discoverer, and it is now supported by the authority of customs and legal decisions going back to the earliest days of the oil industry of Pennsylvania. It is difficult to see how the principle that the oil and the gas present below a given tract prior to their discovery belong to the owner of that tract can be resurrected now after 60 years of disuse. Despite the urge that may come with periods of overproduction, it is doubtful whether such a proposal, if its character were known, would ever receive the support of more than a small majority of the oil producers of the United States.

Government and Stabilization

Legislation that fails to recognize the right of the owner of the surface to the minerals below that surface cannot be upheld by the courts unless the Constitution of the United States is amended to permit it. Common law, the outgrowth of accepted customs, has determined how that right may be exercised in the production of oil and gas. It is no less important that any legislation be in accord with this law as well as with the Constitution. Keeping these restrictions in mind, what can be done by our national or our state governments to aid the cause of stabilization and conservation of oil and gas?

In an industry extending to so many parts of the country and competing with industries operating in other countries, preference would naturally be given to uniform regulation by a central organization such as the national government against local regulations by a number of state governments. However, the powers of the Federal Government are distinctly limited by the Constitution itself. The states have resisted every attempt of the Federal Government to increase its powers to the utmost. They have been supported by the courts in their contentions.

Federal Action Limited

In several instances the United States Government has attempted to assert its authority to deal with problems that concerned several states and were of such nature that action by the central government would have been much more satisfactory than action by the states. One of these cases dealt with the diversion of water for irrigation work by one state from a nonnavigable stream passing into another state. The right of the Federal Government to intervene in this case was denied. Similarly the court denied the constitutionality of an act of Congress designed to regulate the capture and seizure of migratory birds though it was admitted that such legislation would accomplish more than that of the individual states.

In defending his plan of unit operation of oil pools, Henry L. Doherty made frequent reference to the right of the Federal Government to provide for the common defense. As petroleum is essential in war and as our reserves of this substance were being depleted at a rapid rate, he believed that the Federal Government had the right to take steps to regulate operations in the interests of conservation. The authority of the government has been considered as arising from Section 8, Article 1, of the Constitution. This reads as follows:

"To lay and collect taxes, duties, imposts and excises, to pay the debts and provide for the common defense and general welfare of the United States; but all duties, imposts and excises shall be uniform throughout the United States."

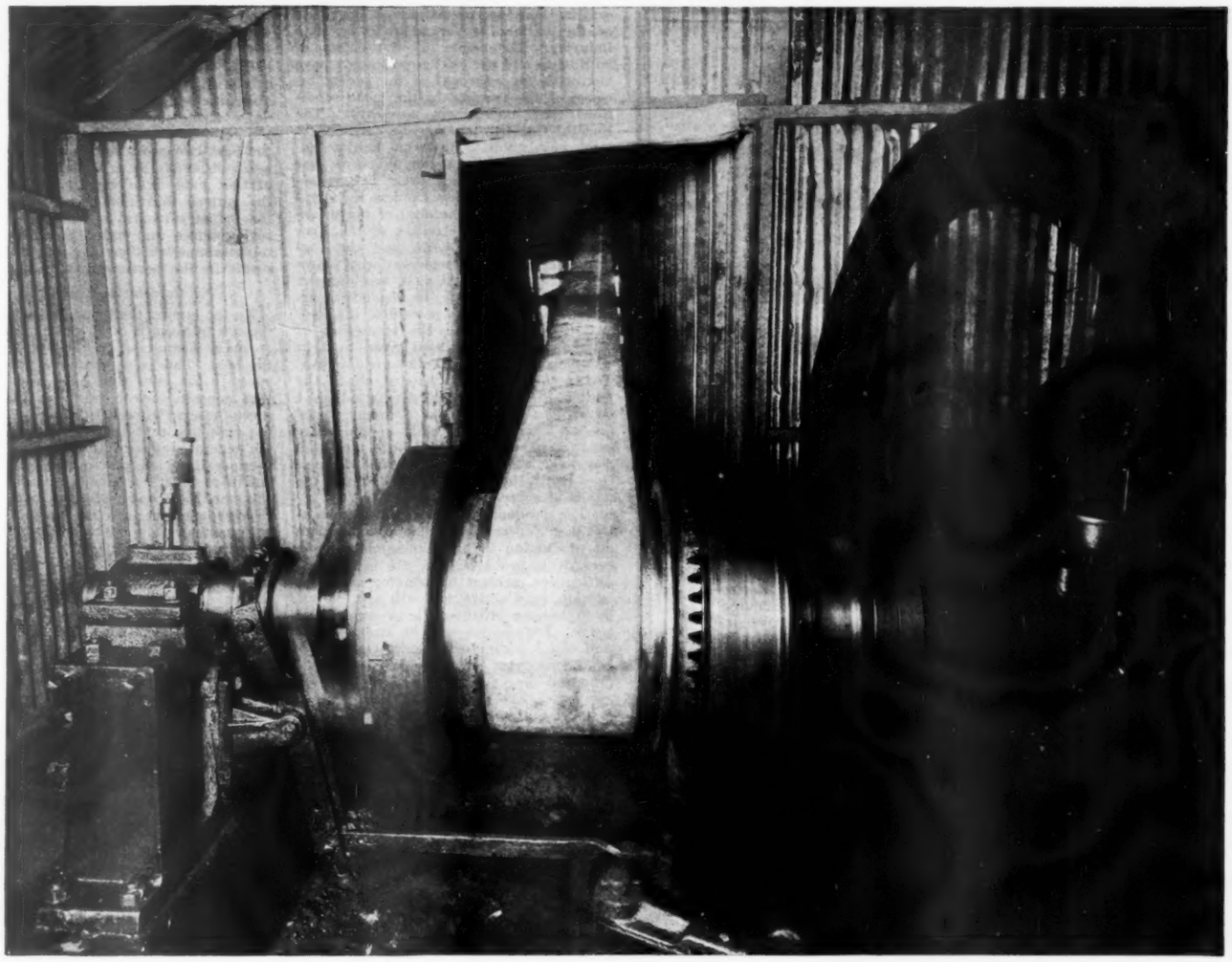
The wording of this sentence leaves no doubt that it was intended to deal only with the power of the central government to tax. It has been so interpreted by the courts. It is generally believed that the only other possible source of authority for national regulation of the oil business rests in the authority granted to the Federal Government to regulate commerce between the states. No one will question the authority of the Federal Government over the operation of pipe lines and other means of transportation used in the moving of oil from state to state. The activities of marketing companies whose organizations cover more than one state are matters in which it has the right to be interested. It is generally felt that the central government has the power to intervene in cases concerning operations of individuals or companies within a single state if those activities have a distinct influence upon conditions in other states. Thus, though a monopoly carried on all of its operations in one state, its activities would undoubtedly come under the restrictions of the antitrust laws of the Federal Government if its products were sent beyond the borders of that state.

Child Labor Precedent

Yet the Supreme Court has been most careful to protect the rights of the local or state governments in the regulation of all portions of industrial activity that were of local concern. From a moral and ethical standpoint, no legislation ever passed by Congress deserved greater support than that designed to regulate child labor throughout the country. Despite this, the Supreme Court denied the power of Congress to legislate in this matter on the principle that it would tend to destroy the rights of the states to legislate over matters of local interest. In defending the child labor laws the Federal Government contended that its authority came from the fact that the products of that labor entered interstate commerce. It is difficult to see how after this decision the authority to regulate interstate commerce could be extended to include the manner of production or the refining of oil, both of which are purely local industries.

Federal Power Unlikely

Yet it is these, and especially in the former, that the problems of overproduction occur. Any legislation leading to stabilization or conservation would fail in its purpose if it did not include provisions for the prevention of overproduction and waste at the well. It is possible that less conservative justices may be more lib-



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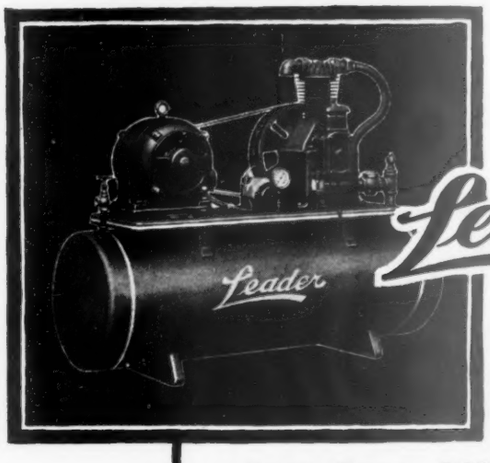

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eral in their interpretations of the rights of the national government to regulate industry. Extensions of the rights of both state and national governments have met with the approval of the courts because of the changes in the basic conditions that made them necessary. The Federal Constitution may be amended to meet new needs. However, neither extensions to rights under old laws nor the granting of new powers by amendments are likely to occur unless the country as a whole is convinced of the necessity. Despite the activities of the Federal Conservation Board, and the general interest in the conservation of petroleum, the writer feels that less support would be given today to legislation designed to increase the powers of the Federal Government over the production of oil than would have been given to it in the years immediately following the war. Today the visible supplies of oil in the United States and available in adjacent countries seem adequate for many years' needs. Then the possibility of immediate exhaustion under the suddenly increased demands of the automobile and through the substitution of oil for coal was in the minds of everyone.

"The development of legislation permitting the Federal Government to regulate oil production is not impossible. However, it is probable that the mechanical difficulties incident to bringing such legislation into active use will not permit it to become effective for a number of years. For the present, at least, regulation of oil production is much more likely to come from the states in which oil is produced than from the Federal Government.

States Rights Restricted

The rights of the states are much less clearly defined than those of the Federal Government. The interests of the individual state are not necessarily identical with those of the country as a whole. They may be directly opposed to the interests of an adjacent state. The States of West Virginia and Oklahoma have both attempted to prevent the exportation of gas to consumers in other states in their desire to maintain an adequate supply of that fuel for the industries within their borders. States and their more local subdivisions have shown a tendency to invade the rights of the individual where such invasion tends to improve the welfare of the group as a whole. Such invasions have been based upon the concept that the police power of the state gives it the right to legislate not only to protect the health and safety of its citizens but also to encourage the development of its natural resources and to promote the prosperity of the group as a whole. Where such tendencies come in direct conflict with the rights of the individual to enjoy his own property, he falls back upon the guarantees that have been given to him under the due process clause of the Fourteenth Amendment to the Federal Constitution. However, neither the Constitution nor the amendments state definitely at what point the rights of the group end and those of the individual begin. It is evident that the line of demarcation cannot be the same in all types of groups and that it will change within the single group as conditions change. The decisions of the United States Supreme Court indicate that no fixed rules may be set as to what will be held constitutional. Each case will be decided largely upon its merits and with reference to the conditions existing at the point where the case originated.

Police Power

Any extensions of the police power of the states tending toward regulation of the oil industry must of necessity encroach upon the rights of the individual. Acquiescence to such extensions on the part of the individuals who make up the oil business for a period of years would greatly increase the chances of such actions being declared constitutional. Open support of measures taken by the states can only be considered by the courts that are making the decisions as an indication of the merit of the action taken and the willingness of the individual to subordinate himself to its requirements. In periods of overproduction, such as that of the past two years, support is frequently given to measures that would be attacked under any other conditions. Yet the support given at such times may lead to permanent loss of valuable rights.

The oil industry has heard a great deal about the danger of regulation from without. Even the most casual survey of the actions taken by the industry during the past two years will indicate that the possibilities of the extension of state regulation have been greatly increased by the actions that have come from within the industry itself. It would be wise to review these and other possible actions to determine whether they will ultimately result in the best returns.

Correlative Rights

To the lawyer the principle upon which the law is based is of as great importance in many instances as the substance of the law. This is particularly true in respect to the laws that have been passed that concern the oil business. In some cases these have been based strictly upon the principle that they were essential to the general welfare. In others they have been designed to protect the correlative rights of others producing oil or gas in the same pool and rested upon the principle that no one may use his property in such manner as to prevent another from enjoying the use of his. In general it may be said that the states in attempting to lay down broad methods of procedure to improve the conditions within their borders are likely to rely upon the first principle. However, the courts have not shown themselves as favorable to such action. The more successful legislation has been based upon the principle of correlative rights. Much of it has, as a matter of fact, been merely the conversion of established customs into compulsory regulations. Legislation, regardless of the principles used, may be divided into three types: Regulations covering production, purchasing and transportation, and use.

Bills attempting to define the use to which oil may be put have received but little support up to the present. In the conservation laws passed by the Legislature of Oklahoma in 1915, the Corporation Commission was given the power to prevent economic waste. This would probably be considered by many as giving it the power to prevent the use of oil for the less desirable purposes, such as its use as a fuel under boilers. However, no attempt has been made to prevent such use up to the present. It is difficult to see how any regulation of this type could receive the support of the courts. Yet, similar legislation applying to the use of gas has been approved by our courts.

Carbon Black Laws

Except for the more recent carbon black laws, the most important legislation coming under this heading was that placed upon the statutes of Indiana in 1889 and immediately afterward. These laws were passed during a period in which the State of Indiana was swayed by the fear that its rapid industrial development would cease unless adequate supplies of natural gas were guaranteed for the future. Among the laws passed were regulations prohibiting the use of natural gas in flambeau lights as a wasteful practice tending to destroy the natural resources of the state. The Supreme Court of Indiana upheld the law upon the principle of general welfare. Similar legislation has been passed by other states.

The most famous of the carbon black laws is that of Wyoming, passed in 1919. This prohibits the use of natural gas for the manufacture of carbon black within 10 miles of a town or an industrial plant unless the heat produced is used for manufacturing of domestic purposes. The constitutionality of this law was upheld by the United States Supreme Court. The lead of Wyoming has been followed by Oklahoma, Arkansas and other states. However, opinion is by no means united in favoring such laws. The decision of the Supreme Court in the Wyoming case was not unanimous, several of the ablest members of the court dissenting. In addition a similar measure passed by the legislature of Montana was declared unconstitutional by the Supreme Court of that State. The measure differed from that of Wyoming in declaring an abso-

lute prohibition of the use of gas in making carbon black.

Preferential Use

At the present moment it is impossible to say what decision would be made if another carbon black case, especially one in which such use was absolutely prohibited, were carried to the United States Supreme Court. Such measures have been defended largely upon the principle of general welfare. This may be found to be a less desirable basis than the principle of correlative rights. In any case, the absence of agreement in this regard together with the number of decisions supporting the rights of the individual in the use of his property indicates that the extension of the principle of preferential use of gas is not likely to receive the support of the courts for some time. Similarly it does not appear that legislation restricting the use of petroleum in the form of a fuel oil or as a road asphalt will receive support from the courts unless the exhaustion of our oil resources becomes imminent. In that case, such legislation would probably be unnecessary.

At the same time that the Legislature of Indiana passed the law prohibiting the use of flambeau lights, it attempted to prohibit the exportation of natural gas to other states. This law was based upon the same principle of common welfare. It was held to be unconstitutional by the state courts. The effects of the decision were somewhat overcome by the passage of laws which made it physically impossible to export gas. More recently Oklahoma and West Virginia have attempted to prevent the transportation of their gas to other states. The laws of both states were declared to be unconstitutional by the Federal courts. In the light of these decisions it does not appear that there is any possibility that an oil-producing state would receive support from the courts in attempting to restrict the use of oil to consumers within its borders. Laws of this type are contrary to both the due process and commerce clauses of the Federal Constitution.

Proration

It is difficult to separate those laws that attempt to regulate production from those that regulate purchasing and transportation. During the early days of the oil business the producers formed a class that was entirely distinct from the purchasing and transporting group. Where production was in excess of demand and facilities to remove the oil were insufficient, the purchaser found that proration of purchases and runs tended to maintain good feeling betwen the producers and himself. This practice does not appear to have reached the status of law but was generally lived up to. However, it did not prove capable of functioning smoothly during periods of continued overproduction when the weaker producers attempted to market more oil by selling under the general price. With the entrance of the large purchasers into the business of producing oil came additional difficulties because of their changed viewpoint. It was natural for such companies to run as much oil from their own leases as possible before making purchases from other owners. One of the most flagrant examples of this occurred in the development of Glenn Pool and led to the passage of legislation requiring pipe line companies to purchase and run oil on a proration basis from all leases whenever production exceeds demand and transportation facilities.

Similar laws, some dealing with oil and others with gas, have been passed by other states following the lead of Okiahoma. Their constitutionality has not been tested, purchasers and pipe line companies seemingly concluding that the temporary gains secured in producing their own leases to capacity were not sufficient to offset the bad feeling that was created between the other producers and themselves. During the overproduction resulting from the development of Cushing, the Corporation Commission relieved the pipe lines from the necessity of obeying the law in order to make full runs from the older settled leases whose owners had been seriously affected by the low prices.

Case of Cushing

Proportional purchasing and transportation of oil is closely interwoven with prices. The tremendous production of Cushing and the inability of some of the producers to provide storage and the unwillingness of others to abide by any shutdown agreement created an immense supply of oil that had to be marketed immediately. Prices collapsed despite the efforts of the Corporation Commission to force the purchasers to maintain them. Sale by posted price gave way to sale by individual contract. Proration of purchases and runs gave way to the law of necessity, the purchaser taking the oil that was offered at the lowest prices. Those who could placed their oil in storage and prepared to wait for better prices.

Practically all of the pipe lines operate under common carrier laws. They receive a number of privileges under those laws. In return they place themselves in a status closely allied to that of public utilities. There is little doubt that the states and possibly the Federal Government, in cases where interstate movement is concerned, would have the authority to require proration of the runs made through the lines of any pipe line company. However, a large proportion of the producers can not offer oil for shipment because they have no direct connections with refineries that might consume it. They are entirely dependent upon the large crude oil purchasing companies, the middlemen of the crude oil business. It is difficult to see how such companies could be forced to buy oil from any given producer. Thus we are faced with a legal dilemma. The state may prorate the capacity of a pipe line between the several shippers desiring to send oil to given points on that line, but it can give no assistance to the producer who is unable to guarantee that the oil will be accepted and removed from the pipe line when it arrives at its destination. The only way of removing that dilemma seems to lie in declaring purchasing companies public utilities. The undesirability of such action is so apparent that further discussion appears unnecessary.

Regulation of Production

We have left the alternative of state regulation of production. Regulations under this heading may be considered as of two types: those designed to bring about proportional recovery by the several owners, and those tending to prevent private or public waste. Both types bring up questions of fundamental importance to the oil industry.

Legislation leading toward proportional recovery of oil or gas is based directly upon the assumption that the owner of the surface holds title to the portion of these substances that lie below his surface. It is directly opposed to the fundamental principle that the right of the surface owner is limited to the right to reduce to possession and that he has no title until he has reduced the oil or gas to his control. Both custom and the highest courts have supported the owner of the surface in the right to drill as many wells as he pleases, to locate them as he desires and to produce the oil and gas that he can draw into them regardless of its amount or whether it originally came from below his own or from other properties. These rights are transferred to the lessee, who in turn agrees to do everything that may be necessary to assure the owner as large a recovery as possible. The profits of the lessee depend upon the manner in which he conducts his operations. Failure to drill an adequate number of wells, to locate them to best advantage, or to use the methods of drilling or production that will give the greatest speed in recovery commensurate with their cost can only cause loss to him.

Proportional Taking

In the opinion of the Supreme Court of the United States in the case of the Ohio Oil Co. versus Indiana, written in 1900, the principle of "in situ" ownership was condemned. Yet the court speaks of the reduction of an "undue proportion" of the gas to possession by one of the owners. Despite custom and decisions in cases in Kentucky in 1908 and in Louisiana in 1925 squarely condemning the principle of in situ ownership and restrictions upon the right of any individual to

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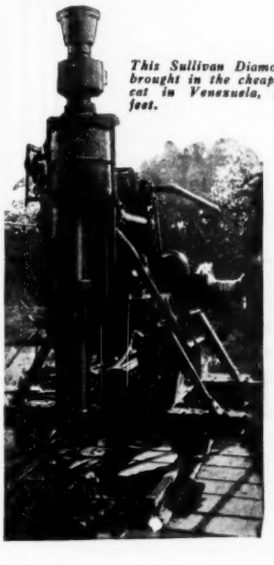

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take gas as he desires from wells on his property, the principle of proportional taking persists. A number of states have regulations limiting the percentage of its capacity that a gas well may produce. These are primarily proportional taking restrictions but because of their evident unconstitutionality on that basis have been declared to be regulations against waste.

The Legislature of Louisiana has passed laws which regulate the spacing and location of gas wells and oil wells. Such rules may be based upon the principle of preventing waste but their application tends definitely toward the enforcing of proportional recovery. The Railroad Commission of Texas, the body to which the power to regulate the business of oil production has been delegated by the Legislature of that State, adopted a rule prohibiting the drilling of wells within 300 feet of any other well or within 150 feet of a boundary line except in the Gulf Coast Field. Exceptions to the rule were to be permitted where the facts justified them in the opinion of the commission.

Oxford Oil Case

This rule has led to a case that may prove to be of very great importance to the oil industry. The Oxford Oil Co. was the owner of a strip of land 3,190 feet in length, but only 36 feet wide at one end and 57 feet wide at the other. It desired to drill 10 wells on this strip An adjacent lessee, the Atlantic Oil Producing Co., called upon the Railroad Commission for relief from the proposed offset wells. The commission restricted the Oxford Oil Co. to four wells, thus materially decreasing the amount of oil that it could expect to drain from adjacent properties. Because of fear of a heavy fine, the Oxford Oil Co. obeyed the ruling. However, it immediately sued for damages, claiming that the order amounted to the taking of property in violation of the Fourteenth Amendent of the Federal Constitution. The court sustained the ruling. Appeal was taken and the case carried finally to the Supreme Court of the United States. On April 16, 1928, that court sustained the lower courts and upheld the right of the Railroad Commission to enforce the ruling that it had made.

It is to be regretted that the case was allowed to go to the Supreme Court. Because of the very unusual form of the tract involved, this case cannot be considered as a test case and indicative of what the Supreme Court might decide in another case. The limited resources of the Oxford Oil Co. did not permit its attorneys to secure additional legal advice to the extent that those of a larger company would have. There is no question but that the drilling of 10 wells would have forced the Atlantic Oil Producing Co. to drill a greater number of offset wells than it did or lose oil to its neighbor. At the time the original ruling of the Railroad Commission was made there was no way of definitely proving whether such additional wells would pay for themselves. Undoubtedly the ruling tended to prevent the drilling of an excessive number of wells and thus the expenditure of an excessive amount of money. Undoubtedly it served to keep the recovery of oil from the adjacent tracts more in keeping with their relative sizes. It was then a regulation tending to enforce proportional recovery. As such it is contrary to the system of ownership under which the oil business has developed.

Another Dilemma

Again we have a dilemma. The action taken by the Atlantic Oil Producing Co. is in keeping with sound business economics. That asked by the Oxford Oil Co. was based upon the long-established principle that an owner may drill as he desires. The court subordinated that principle to the principle of conserving the rights of adjoining owners. As there was no question of waste involved, it would appear that the courts were inclined to favor the view that the surface owners hold title to the oil below their lands even before it is reduced to their possession. If this view is to be sustained, there will be no inducement for the small operator to carry on wildcat operations and no reward for initiative. Yet the decision in this abnormal case will have great weight in future decisions of more typical cases involving the rights of states to regulate drilling.

Both oil and gas producers have always favored those customs that tended to reduce waste and to protect the oil and gas horizons. In the rush of development they have not always carried on their operations in keeping with the principles which they have recognized as most beneficial to all. However, once the customs became laws, the producers as a whole have done all that they could to abide by them. Recognition of the injuries that result to oil and gas horizons by the entrance of water from other horizons led to laws requiring the plugging of wells at an early date. Such laws have been added to until they now include regulations concerning the manner of setting casing, cementing and the testing of water shutoffs. The constitutionality of laws of this type has been affirmed again and again by the courts. In most of the cases the courts have sustained the laws upon the basis of protection of the rights of the correlative owners of the oil and gas in a given pool. However, the basis of general welfare would probably be equally usable in most instances.

Preventing Waste

The support given to such regulations by the courts has led to attempts to control production operations through laws based upon the principle of preventing waste. The most important case dealing with oil and gas rights was undoubtedly that of the Ohio Oil Co. versus Indiana carried to the United States Supreme Court in 1900. The case arose from the failure of the Ohio Oil Co. to prevent the escape of gas from a well that was producing oil as was required by a statute that had been passed by the Legislature of Indiana in its efforts to conserve the resources of the State. The company defended its action upon the grounds that its was interested solely in oil production and not prepared to handle the gas and could not be expected to go to the expense of shutting it in. The State based its rulings on the principle that the action tended to waste the resources of the State and injure its general welfare. This basis was denied by the Supreme Court which, however, held the law constitutional and substituted the basis of prevention of waste to the common owners of the potential production. From this decision it may be inferred that any legislation resting directly upon the principle of preventing waste of gas in production is likely to be sustained.

The decision of an Indiana court in another case tried at the same time is also of interest. One operator sought to restrain another from pumping gas from wells on its property upon the basis that the pumping reduced the back pressure and tended to cause premature flooding of the gas horizon and to destroy the value of the horizon. The plaintiff was able to prove the injury to the satisfaction of the court and was given the relief that he desired. Rulings of this type tend to bring about proportional recovery; but, as they are based directly upon the principle of protection of the rights of the common owners against waste through water invasion. they may be expected to receive the support of the courts.

Protecting Owners

It is clear that the State has the right to legislate to protect the rights of correlative owners against the destructive and wasteful actions of one of their number who fails to protect the oil and gas horizon from water, or permits oil and gas to escape to the ground or to the air, or operates in such a manner as to cause permanent injury to the horizon. It would appear probable that an operator in pools like those of western Texas where water under high pressure tends to trap the oil in the horizons when the wells are permitted to flow without back pressure would be supported by the courts if he applied for relief from the actions of one who re-

fused to restrain the flow of his wells sufficiently to prevent such trapping.

It is clear that the courts will sustain the states in regulations prohibiting the blowing of gas wells in order to draw in oil from under adjacent lands upon the principle that such action is wasting the common property of the correlative owners. It is probable that the courts would acknowledge the right of the state to intervene whenever oil was produced in such amounts that it had to be run upon the ground because of lack of transportation facilities or tanks. It is not so certain that the court would feel that the state could interfere if the owner of the gas well made arrangements to pipe the gas to some consuming center even though he sold it at a price far below its intrinsic value. Neither is it certain that the state could restrain a producer from running his wells at capacity and selling his oil below the general price level if it was handled without physical loss.

In both cases the rapid lowering of the pressure in the producing horizon would probably cause a lower ultimate recovery. Yet it would be difficult to prove that physical waste of oil or gas had occurred. Certainly the State of Oklahoma could not sustain the proration and shutdown orders that it issued in 1927 and 1928 upon the basis of preventing physical waste in production. Practically no oil went on the ground in the development of Seminole. The handling of water problems was in keeping with the best engineering practice known.

Economic Waste

Unless we fall back upon the principle of proportional taking and the ownership of oil and gas "in situ" we are forced to conclude that the Corporation Commission based its actions upon the powers granted to it by the legislature to prevent economic waste. In as much as the assistance of the Corporation Commission was requested by a number of operators, it would appear that those operators are willing to allow the State to exercise this power. When Federal Judge Vaught dissolved a temporary injunction secured by the Reiter-Foster Oil Corp. against the enforcing of a proration order in the Little River Pool, this new power of the commission was given its first legal approval.

The conditions leading to the request that the Corporation Commission take charge of production in Oklahoma were serious. Yet it is doubtful whether any operator would have consented to give the State the power to regulate production whenver the oil industry is threatened by that most indefinite and indefinable thing known as "economic waste" in order to secure immediate profits. Possibly in the future a clear and definite meaning will be assigned to this term and such authority may be delegated to the states without fear that it may be used to the detriment of the rights of the individual. At present there is no certainty that such regulation will not lead indirectly to the replacement of the "reduction to possession" system of ownership under which the industry has developed by the "in situ" system that it has refused to accept in the past because of its inability to reward the men whose initiative and courage made it possible.

Limitations of Legislation

Stabilization means much to the oil industry. Conservation of oil is desired by the nation as a whole. Yet, unless the Federal Constitution is amended, effective regulations to those ends can only be made by the states. Such regulations may take the form of regulations concerning use, or of purchasing and transportation of crude, or of production. The limitations of legislation under the first two headings are fairly well defined. The extent to which legislation regulating production can be carried depends largely upon the actions of oil producers. Failure of the industry to realize its obligations to the welfare of the states and the nation will bring attempts at regulation. The courts will give some protection against legislation based solely upon the principle of general welfare. Precedent will protect the industry from proportional taking legislation for some time if it is clearly defined as such. However, legislation against waste is supported by many decisions of the courts and the term waste is of uncertain meaning. Extension of the term to include "economic waste" or other equally indefinite forms of waste will give the states adequate power to legislate but such meanings will also give results equivalent to those that would develop from proportional taking legislation. Is there no way of overcoming overproduction, of accomplishing true conservation, and bringing stabilization to the oil industry other than by legislation that will eventually destroy the principle that to the man with initiative and courage belongs the reward? If there is, it must be brought forth now, before acquiescence to such regulations in the interest of present profits creates the precedents that will be cited by the courts of tomorrow.

CENTRAL WEST FIELDS

(Continued from Page 74)

Section 26. The Kemrow Co. found a dry hole in the Salt sand at 830 feet in No. 2, Plumey J. Riggleman, Fractional Section 5. Same company made a location for No. 3, L. A. Boyd, Section 36, also for No. 9, Edmund Parker, Fractional Section 4, same township. Ohio Fuel Gas Co. is drilling No. 4-3,471 on the T. J. Newburn, Lot 23. In Penn Township, Smith & Dunn are drilling No. 20, Laura B. Riley, Section 11.

In Belmont County, Somerset Township, W. C. McBride, Inc. made a location on the J. N. and E. Kirkbride, Section 1, and Gilbert Howell and others are drilling on the C. J. and Mary E. Huntsman, Section 25, same township.

KENTUCKY-TENNESSEE

(Continued from Page 74)

No. 1 Tony Hansford farm, in the Brown Pool, produced an initial of 40 bbls.

Cumberland Petroleum Co.'s initial venture on the Widow Salmon lease, east of the Burton farm, in the Burton Pool, is credited with 70 bbls. initial, and Huff & Calderwood's No. 5 Bell Salmon farm, same area, is also reported at 70 bbls. initial. Smith, Randolph and others' No. 10 Oscar Wells, in the Brown Pool, is said to show around 20 bbls.

In the Jones Pool, Wade & Moore are reported to have a 40-bbl. showing at No. 3 on the E. L. Baird farm.

Ohio County Wells

Just at this time most excitement prevails in the vicinity of Bells Run, north and a little west of the Ambrose Pool, where Carpenter, Cockrell & Clay, along with Maple & Lyle, brought in a test on the Tom Howard farm, reported at better than 50 bbls, after pumping for two days at the rate of 75 bbls. each 24 hours. Several new wells have already been started surrounding this new well. The Creek Drilling Co., or Miller & Damron, owners of one-half of the Tom Howard lease, is now drilling an offset to the producer. Maple, Lyle & Brown Brothers moved a machine on the T. L. Hickey farm, which is another offset to the Howard well and is now spudding in. James C. Ellis and others secured a lease on the Matt Satler farm, and are offsetting the Howard well, which will be 600 feet north of the Howard. No. 2 is being started on the Howard by Carpenter, Cockrell and others.

J. E. Hare's test on the Jesse L. Ralph 42 acres, in the Adaburg area of Ohio County, is reported as a 5-bbl. pumper at a total depth of 506 feet, after given a shot of 40 quarts. In this well a string of 460 feet of casing was set and pay found at from 483 to 494 feet.

Along the Gossett 30-foot road between the Bob Hamilton, Gossett and Jane Daniels farm, wells are being drilled 150 feet apart north and south and 30 feet apart east and west. Six wells have been completed, but they are only small producers of the 5-bbl. variety. The Cumberland Petroleum Co. has completed Nos. 17 and 18 on the Bob Hamilton north 176 acres, and both are reported at 5 bbls. James C. Ellis has drilled in Nos. 13 and 14 on

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the Jane Daniels farm, reported at 10 and 8 bbls., respectively. The Globe Oil Co., which is drilling the 30-foot strip of road, has drilled in No. 2, which is said to be good for 5 bbls., and is drilling Nos. 3 and 4, same strip. Cumberland Petroleum Co. is drilling No. 19 and 20 on the Bob Hamilton north 176 acres, and James C. Ellis is reported to be drilling No. 15 Jane Daniels and No. 10 Gossett. According to reports about 18 wells are to be drilled on the three leases up and down which mean six wells on the strip and six others on each side of the narrow strip.

The Ohio Oil Co.'s second test on the Rosette Taylor farm, in the Whittaker Pool, is reported good for 5 bbls. at a total depth of 785 feet after a 20-quart shot. In this well a string of 770 feet of casing was set and sand from 780 to 785 feet.

Wheeler & Botts' second test on the Edward Crow farm, in the Gil Jolly Pool, 3 miles west of Buford and about 8 miles west of the Ambrose Pool, is reported at 5 bbls.

New Domain Oil & Gas Co.'s No. 7 F. L. Royal farm, in the Friendship Church area, is reported with an initial production of close to 30 bbls.

Other Completions

The Penn Homa Oil Co.'s No. 19 on the Hobson heirs, west of Bowling Green in Warren County, produced but 1 bbl. at a depth of 973 feet.

In the Gainesville area of Allen County, E. D. Depenbaugh's No. 1 L. Beam is reported dry.

Albertson, Ramey & Robinson drilled in a wildcat on the Myrtle Lyons farm, between Lewisport and Hawesville, just across Ohio River from Troy on Kentucky side in Hancock County, and 32 feet of sand was drilled through with a heavy dose of salt water and but little oil and plenty of mud and goes as a duster. This test is also across the river from the wells of the Packard Oil Co. in Spencer County, Indiana.

Field Pickups

The Foster Petroleum Co., Bartlesville, Okla., is starting a test on the Wedding farm, northeast of the Ambrose-Weller Pool, in northern Ohio County. The contract work will be done by McMahan & Combs of Owensboro. This location is between the Ambrose Pool and the Midkiff Pool and if it develops commercial production will add much heretofore supposed worthless territory to the Ohio County area.

Daley & Lowman are drilling No. 6 on the Burton farm, in the Burton Pool of Daviess County. McMahan & Combs are starting a test on the Black farm, south of the Burton Pool, same county, and close to the Hartford Road.

Mr. and Mrs. Jewell C. Preston, formerly of Bowling Green and Glasgow, have moved to Owensboro. Mr. Preston is representative of the Preston Syndicate.

Unknown parties have moved in drilling rigs for two tests in the northwestern part of McLean County. One will be set up on the Brown farm, near Beech Grove, and the other near the hamlet of Wrightsburg. The outcome of these tests will be watched with interest, being between the Davis-Ohio County Fields to the east and Henderson and Webster County Fields to the west. Some oil was found years ago in the vicinity of Beech Grove, but with no market, the work was given up, and Beech Grove lies just across the Webster-McLean County line from the development work in what is known as the Sebree Field, where some fairly good wells have been found during the past few months.

A drilling outfit has been moved to the M. D. Yeiser farm, and a well will be drilled on the hill near the old deer park, near Utica, in Daviess County. A well will be started at once by unknown parties on the Miss Mary T. May's farm, also in the Utica area.

Ogle and others are drilling No. 2 on the Payton Royal farm, in the Friendship Church area of Ohio County.

H. A. Henry is drilling a second test on the W. T. Payne farm, in the Pellville area of Hancock County.

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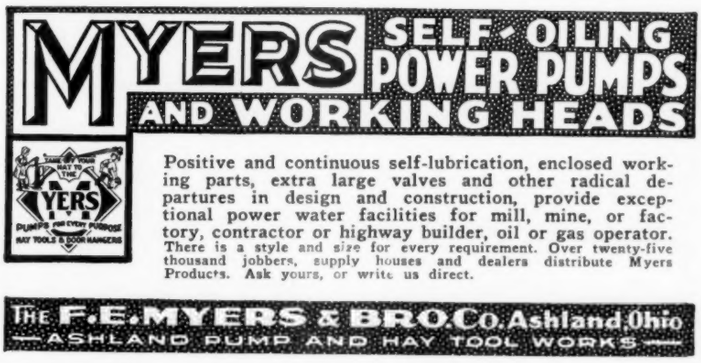
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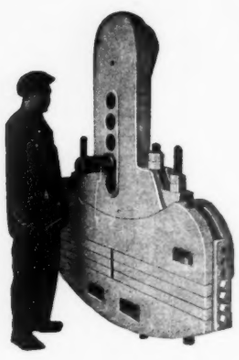

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COMMERCIAL MAKING OF HELIUM CONTRASTED

(Continued from Page 82)

Journal. We believe that the natural gas and oil industries will be glad to get this knowledge and we think that everyone is entitled to it.

"Whenever we find a field that shows a good helium content we immediately take up a block of leases covering the structure in order to be insured of a future supply of a sufficient operating reserve. We have a leaser who follows these explorations carefully."

Testimony submitted to the Appropriations Committee of the House of Representatives by the Kentucky Oxygen-Hydrogen Co. through its representative, E. H. Courtenay, attracted considerable interest. It showed that this company had been under contract to supply the Navy with helium since September 1, 1927, at $35 per 1,000 feet.

"I wish to point to the fact," Mr. Courtenay said, "that this price is substantially less than the cost of helium produced by the government plant and operated by the Bureau of Mines. We have been permitted to supply a portion of the helium requirements of the Navy but none of the requirements of the Army.

"Due to the fact that the Bureau of Mines is now producing helium the Navy Department has felt obligated under the current appropriation act to purchase a portion of its helium requirements through the Bureau of Mines at a price considerably higher than the commercial price. Furthermore, the War Department has interpreted the current Army appropriation act as prohibiting them from purchasing helium for the air corps from sources other than the Bureau of Mines. The result is that the Government is paying an excessive amount for its helium requirements."

It was in view of this statement that the committee was asked to change the language of the Army appropriation bill to remove any doubt on the part of the War Department respecting its right to purchase helium on more favorable terms by private contract. The committee was assured that the Army requirements could be met by purchases from commercial sources to better advantage.

It was shown that the Fort Worth helium enterprise cost the Government at least $10,000,000. Of that amount, $2,000,000 was chargeable to experimentation so that when this plant was abandoned in order to conduct explorations in Amarillo $8,000,000 went to the cost of producing the helium that had come through that extraction plant. The total helium extracted was 43,000,000 feet, which would make the cost to the Government about $186 per 1,000 feet against $34.77 charged by the Helium Co. at Dexter, Kans., which involved no outlay on the part of the Government in connection with it.

The estimated requirements of the federal Government for helium for the fiscal year beginning July 1, 1928, amounted to 7,000,000 feet. Mr. Courtenay said the helium plant of the Kentucky Oxygen-Hydrogen Co. at Dexter, Kans., could easily produce that amount with its present equipment and the available supply of helium-bearing gas and have several million feet of helium to spare. A communication involving the above statements was placed before the committee by the Kentucky Oxygen-Hydrogen Co., signed by W. H. Girdlen.

Mr. Courtenay stated that the investment of the Helium Co. to produce 8,000,000 feet of helium was approximately $200,000. He said his company believed it had 500,000,000 feet of helium-bearing gas in the Kansas field. The helium-bearing gas in Texas, he said, is going to waste by use of the natural gas without extracting the helium.

The committee was informed that the price of the Bureau of Mines July 3, 1928, for helium gas not in excess of 95 per cent purity was from $45 to $50 per 1,000 feet, which was supposed to be the cost to the Government of producing helium gas. On the other hand, the Navy

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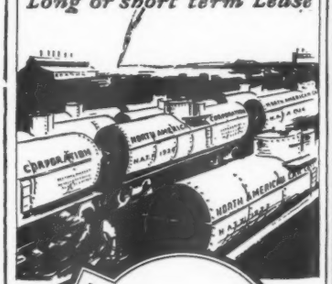

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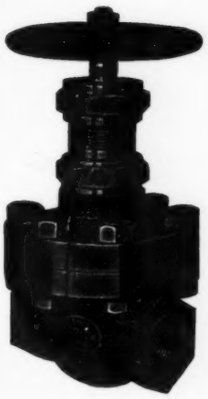

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paid to the Helium Co. $34.77 per 1,000 of 98 per cent purity, this gas being from the Oxygen-Hydrogen company through its plant at Dexter, Kans.

At Nocona, only 85 miles from the helium plant at Fort Worth there was 75,000,000 feet of helium-bearing gas and only a pipe line was necessary to convey it to Fort Worth, but that has all been abandoned and the new plant has been established at Amarillo.

Mr. Courtenay said his company believes helium should be extracted from natural gas before the gas is burned and if the Bureau of Mines would co-operate with his company he said that could be done. Today the helium is being wasted in gas that is being burned while the kind of helium his company is putting through the extraction plant is not useful for any other purpose.

One of the curious features involved in the discussion of the price of helium is the fact that the money for the Amarillo plant was appropriated, and the Bureau of Mines has stated that it can produce helium from that plant at $20 per 1,000 feet, against the current price being paid to the helium company of $34.77. The Bureau of Mines, however, makes its estimate of cost based entirely on the cost of operation and cost of the gas it treats, throwing into the discard the item of $2,000,000 spent on facilities at Amarillo. Of course, the purchase of helium from private industry includes all items of expense covering every class of overhead as well as operating expenses. However, as some senators and representatives have remarked, we have put up the money for the plant and we may consider that the operating cost only is the cost of helium.

The Kentucky Oxygen-Hydrogen Co. has faith in the future of lighter-than-air ships, not only for the Government but for commercial uses. It is accepted as a fact by that company that to sustain its efforts before commercial uses are developed contracts to supply government needs will be most important. The company regards the lighter-than-air ship and the airplane as occupying different fields in aviation and does not look upon them as competitive in their separate fields, but as distinctly different as railroad and ocean crafts. The lighter-than-air ship has a distinct field in ocean travel and transatlantic flights are the immediate objective as commercial enterprises for the carriage of mail and passengers.

Just what demand there will be for helium gas and how long it will be before the waste of this noninflammable gas will be stopped is one of the problems that faces the industry, but it is believed the time is not far distant when the waste of helium by the burning of helium-bearing natural gases will be as highly uneconomic as was the waste of gasoline in the early days of the oil industry.

MICHIGAN REFINERY

MUSKEGON, Mich., Apr. 20.—The Fayette Refining & Storage Co., of Lexington, Ky., has dismantled its 500-bbl. skimming plant there and is moving it to Muskegon. A new company to be known as the Muskegon Refineries, Inc., will take over the plant. The owners expect to have the plant in operation by June. A. V. Smith of Lexington, Ky., Harold H. Cornelius of Grand Rapids, and Harris E. Galpin and Norbert Lambert of Muskegon, are incorporators of the new company.

REPRESENT PURCHASING AGENTS

The Purchasing Agents Association of Tulsa has selected Frank H. Dunn of the H. F. Wilcox Oil & Gas Co., as a delegate to the convention of the National Association of Purchasing Agents, at Buffalo, N. Y., June 3-6. G. A. Thompson of the Empire companies, Bartlesville, had previously been chosen as a delegate, each association being entitled to two representatives to the national body.

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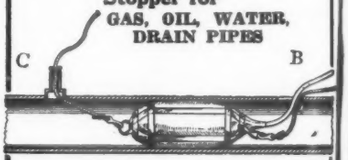

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Three Letters

Three letters in The Oil and Gas Journal's mail, from widely separated subscribers, are worth quoting:

The first, from Seminole, Okla., encloses cash for renewal and says tersely: "I find I cannot get by without it."

The second from New York State returns a copy requested saying he had thought his had not come and had hastily written for another as he "could not get along without The Big Yellow Book."

The third is from a petroleum engineer in Rumania who renews his subscription, apologizing for its possible late arrival and assuring the oversight would not happen again as he wished to keep his file complete.

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Oklahoma-Kansas and Eastern Pipe Line Report

OKLAHOMA-KANSAS
Pipe Line Statement for February

Runs

Company—	Month bbls.	Dly. av. bbls.
Prairie P. L. Co.*	4,284,000	153,000
Gulf P. L. Co.	1,544,164	55,149
Texas P. L. Co.	920,370	32,870
Magnolia P. L. Co.	2,056,003	73,429
Empire P. L. Co.	1,354,635	48,379
Cosden P. L. Co.	691,576	24,699
Sinclair P. L. Co.	2,954,000	105,500
Oklahoma P. L. Co.	3,237,835	115,637
Other lines*	5,936,000	212,000
Total February	22,978,583	820,663
Total January	25,279,954	815,482
Difference	2,301,271	5,181

Shipments

Prairie P. L. Co.†	5,203,883	185,853
Gulf P. L. Co.	1,491,730	53,276
Texas P. L. Co.	1,023,646	36,559
Magnolia Pet. Co.	1,839,486	65,696
Empire P. L. Co.	1,159,106	41,397
Cosden P. L. Co.	863,456	30,838
Sinclair P. L. Co.*	2,944,675	105,167
Oklahoma P. L. Co.	3,028,990	108,178
Other lines*	5,796,000	207,000
Total February	23,350,972	833,964
Total January	26,246,896	846,675
Difference	2,895,924	12,711

Stocks

	Bbls.
Prairie O. & G. Co.*	35,288,000
Gulf P. L. and Gypsy Oil Cos.	9,560,420
The Texas Company	8,296,567
Magnolia Pet. Co.	9,781,060
Empire P. L. Co.	4,491,239
Mid-Continent Pet. Corp.	3,323,897
Sinclair Crude Oil Pur. Co.*	20,697,000
Carter Oil Co.	12,519,259
Oklahoma P. L. Co.	3,354,338
Other lines*	11,825,000
Total February	119,111,780
Total January	118,283,049
Difference	828,731

*Estimated. †Prairie Pipe Line and Sinclair Pipe Line shipments include Texas crude oil.

Note—Stocks do not include approximately 7,900,000 bbls. of crude oil held in storage on private tank farms and leases.

EASTERN PIPE LINE REPORT

Runs from Wells

In the following table will be found the regular receipts from wells by various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky and Indiana for February and March:

	Feb.,'29	Mar.,'29
Nat. Transit	133,165.29	181,078.06
S. W. Pa. P. L.	88,660.70	102,780.57
Eureka P. L.	308,930.88	361,950.53
Buckeye P. L. (Macksburg)	298,720.83	328,651.40
Buckeye P. L. (Cleveland)	10,466.65	11,850.63
Buckeye P. L. (Lima, etc.)	81,725.70	106,736.48
Indiana P. L.	3,645.21	5,695.98
Cumberland P. L.	173,139.79	188,917.24
N. Y. Transit	25,714.25	30,819.36
Tidewater P. L.	188,664.86	216,180.03
Pure Oil	55,790.43	60,961.13
Emery P. L.	59,159.57	64,575.89
Paragon Dev.	16,717.79	14,880.20
Stoll Oil Ref.	6,833.00	6,722.77
Total	1,451,334.95	1,681,800.27
Daily ave.	51,833.39	54,251.62

Note—Indian Refining Co. had other receipts of 305,404.33 bbls. Paragon Refining Co. had other receipts of 174,281.48 bbls. Paragon Development had other receipts of 197.81 bbls.

Petroleum Deliveries

The following tables exhibit the shipments or regular deliveries of various pipe lines in New York, Pennsylvania, West Virginia, Ohio, Kentucky for February and March:

	Feb.,'29	Mar.,'29
Nat. Transit	385,191.81	472,740.05
S. W. Pa. P. L.	334,454.56	324,198.08
Eureka P. L.	203,870.95	227,945.27
Buckeye P. L. (Macksburg)	161,417.11	178,851.61
Buckeye P. L. (Cleveland)	1,932.85	2,675.09
Buckeye P. L. (Lima, etc.)	1,100,029.84	1,398,450.19
Indiana P. L.	1,288,564.76	1,426,742.83
Cumberland P. L.	128,595.90	202,271.56
Southern P. L.	78,401.44	.....
N. Y. Transit	133,227.78	207,577.62
Northern P. L.	154,522.76	185,794.76
Tidewater P. L.	191,990.86	154,430.49
Pure Oil	58,985.39	68,193.52
Emery P. L.	69,672.20	62,136.95
Paragon Ref.	153,894.94	176,375.05
Paragon Dev.	17,084.90	17,320.04
Total	4,462,838.05	5,005,703.11
Daily ave.	159,387.06	161,474.29

Indian Refining Co. reported other deliveries of 314,483.59 bbls.

Gross Stocks

The gross stocks held by various pipe lines in the oil producing sections of New York, Pennsylvania, West Virginia, Ohio, Indiana and Kentucky and Indiana at the close of February and March:

	Feb.,'29	Mar.,'29
Nat. Transit	779,918.51	731,188.54
S. W. Pa. P. L.	473,848.71	430,880.16
Eureka P. L.	1,154,081.70	1,227,449.21
Buckeye P. L. (Macksburg)	533,780.16	496,081.38
Buckeye P. L. (Cleveland)	39,875.08	52,245.56
Buckeye P. L. (Lima, etc.)	2,114,370.56	2,015,652.51
Indiana P. L.	521,024.63	517,499.27
Cumberland P. L.	573,102.52	568,233.96
Southern P. L.	446,321.17	538,367.15
N. Y. Transit	286,204.16	283,675.14
Northern P. L.	401,642.64	377,796.87
Tidewater P. L.	1,303,959.46	1,369,220.70
Pure Oil	14,136.77	8,038.47
Emery P. L.	8,672.52	12,036.26
Indian Ref.	60,203.15	52,393.15
Paragon Dev.	6,568.59	4,622.34
Paragon Ref.	21,124.63	18,740.25
Tuscarora	.....	296,936.59
Total	8,738,834.96	9,002,057.51
Increase	1,141,271.33	263,222.55

Grades of Oil

The following table shows the amount of the different grades of oil held by the eastern pipe lines at the close of February and March, showing the gross stocks of the above fields:

	Feb.,'29	Mar.,'29
Pennsylvania	3,246,721.38	3,315,864.74
Lima	659,187.62	578,882.26
Kentucky	747,383.60	742,122.61
Mid-Continent	3,810,386.65	4,038,082.57
Illinois	275,155.71	327,105.33
Total	8,738,834.96	9,002,057.51

Daily Average Runs

The following table shows the daily average runs of the Pennsylvania, Lima and Kentucky oil fields for the past four years:

	1926	1927	1928	1929
January	55,630	56,209	52,904	51,749
February	60,394	61,298	57,002	51,833
March	61,644	63,247	57,485	54,252
April	63,019	60,927	56,812	.....
May	60,580	60,284	62,067	.....
June	61,121	62,757	58,230	.....
July	63,206	58,674	57,144	.....
August	61,815	60,870	57,745	.....
September	64,639	60,285	53,487	.....
October	161,132	147,080	58,100	.....
November	67,774	57,275	53,565	.....
December	58,755	53,089	52,025	.....

Daily Average Shipments

The following table gives daily average shipments from the Pennsylvania, Lima and other fields for the past four years:

	1926	1927	1928	1929
January	156,056	141,227	146,465	165,721
February	159,488	138,534	167,368	159,387
March	150,239	133,777	158,883	161,474
April	152,374	140,227	172,935	.....
May	160,998	144,594	180,559	.....
June	160,257	149,772	188,024	.....
July	160,045	151,850	189,470	.....
August	151,929	188,653	192,853	.....
September	158,915	144,213	194,138	.....
October	161,132	147,036	176,000	.....
November	172,608	150,975	176,898	.....
December	136,428	144,504	173,572	.....

Gross Stocks

In the following table will be found the gross stocks of the various lines of the Pennsylvania, Lima and Kentucky oil fields, including oil received from other lines at the close of each month for the past three years:

	1927	1928	1929
January	9,718,008	12,276,710	7,596,564
February	10,119,162	12,180,419	8,738,835
March	10,794,044	12,239,725	9,002,058
April	11,112,295	11,740,125	.....
May	11,359,381	11,602,468	.....
June	11,493,673	11,287,678	.....
July	11,468,128	10,819,331	.....
August	11,989,115	10,236,743	.....
September	12,212,716	9,660,910	.....
October	12,047,661	9,229,709	.....
November	11,939,740	8,366,553	.....
December	12,340,297	7,539,555	.....

Franklin Pipe Co.

The following table exhibits the condition of the Franklin Pipe Line at the close of business for the months named and not counted in the stocks and averages reported above:

1928—	Runs	Shipments	Stocks
June	3,153.08	2,779.02	17,922.58
July	2,902.50	3,628.02	17,197.06
August	2,874.11	2,350.13	17,721.04
September	2,820.31	5,255.42	15,285.93
October	1,289.93	538.89	17,551.93
November	2,663.53	788.47	19,426.99
December	3,053.60	3,167.53	19,426.99
1929—			
January	2,099.90	.....	19,313.06
February	2,469.47	6,873.20	17,009.23
March	3,330.82	3,595.01	16,745.04

The Illinois Field

The following table gives the report of the Illinois Pipe Line Co. in Illinois:

Gross stocks, April 1	2,337,759.10
Runs from wells	700,107.14
Other receipts	310,352.09
Regular deliveries	547,544.78
Other deliveries	452,147.86

The amount of Illinois oil run by the Tidewater Pipe Co. in March was 28,212.53 bbls. Deliveries were 38,504.82 bbls. Adding these figures to those of the Illinois Pipe Line Co. makes the runs and deliveries as follows:

1928—	Runs	Deliveries
April	526,013.13	448,282.44
May	632,968.64	522,980.51
June	608,552.49	625,087.33
July	612,286.49	565,678.37
August	639,074.85	671,864.02
September	570,307.91	737,293.50
October	626,147.64	626,290.40
November	576,332.88	702,589.93
December	584,633.00	491,517.26
1929—		
January	570,727.38	545,084.66
February	517,330.17	503,387.70
March	728,319.67	586,049.60

Tidewater Pipe Co., Ltd., also delivered in March 119,507.94 bbls. Oklahoma oil.

AVERAGE DAILY RECEIPTS OF CALIFORNIA OIL AT ATLANTIC AND GULF COAST PORTS

Average bbls. per day—	ATLANTIC PORTS Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
September	11,100	.....	13,967	33,200	6,700	74,967	.....	.....	.....	.....	.....	74,967
October	17,323	.....	11,807	6,483	.....	.....	.....	.....	.....	.....	.....	35,613
November	21,333	5,200	25,400	18,200	7,100	77,233	.....	.....	.....	.....	1,000	78,233
December	4,968	2,968	24,673	18,806	3,064	54,484	.....	.....	.....	.....	2,419	56,903
January	15,838	.....	16,676	11,838	7,938	52,290	.....	.....	.....	.....	5,161	57,451
February	14,214	.....	38,750	17,250	11,607	81,821	.....	.....	.....	.....	3,750	85,571

AVERAGE DAILY IMPORTS OF PETROLEUM AT PRINCIPAL UNITED STATES PORTS

Average bbls. per day—	ATLANTIC PORTS Baltimore	Boston	New York	Philadelphia	Others	Total	GULF COAST PORTS Galveston	New Orleans Baton Rouge	Port Arthur Sabine Pass	Tampa	Total	Total all ports
September	22,933	19,100	110,467	30,700	14,333	197,533	6,367	41,300	6,333	1,667	55,667	253,200
October	20,161	16,839	128,452	27,710	7,098	200,258	.....	32,226	3,065	1,612	36,903	237,161
November	18,400	16,033	133,700	30,267	8,433	206,833	1,333	37,167	4,633	.....	43,133	249,966
December	15,419	15,968	140,871	42,323	8,709	223,290	2,903	35,129	2,355	.....	40,387	263,677
January	11,936	8,903	130,065	34,871	15,709	201,484	.....	34,808	4,093	1,287	40,193	241,677
February	13,750	15,071	135,179	32,750	17,893	214,643	.....	34,357	821	143	35,321	249,964

GROSS PRODUCTION IN UNITED STATES FOR 12 MONTHS

(In barrels of 42 gallons)

1928—		California	Oklahoma	Texas	Kansas	Arkansas	Louisiana	Rocky Mts.	Eastern	Total
March:	Month	19,118,324	20,162,524	21,542,865	3,379,031	2,687,948	1,866,106	2,401,911	3,522,000	74,680,709
	Daily average	616,720	650,404	694,931	109,001	86,708	60,197	77,481	113,613	2,409,058
April:	Month	18,280,729	19,096,920	21,876,913	3,412,260	2,472,600	1,912,187	2,370,810	3,231,000	73,653,419
	Daily average	609,357	636,564	729,230	113,742	82,420	63,740	79,027	107,700	2,421,786
May:	Month	19,331,866	19,443,355	21,220,046	3,367,809	2,543,847	1,926,026	2,525,043	3,619,000	74,276,992
	Daily average	623,609	627,205	684,518	108,639	91,737	62,130	81,447	116,742	2,396,032
June:	Month	19,164,244	18,482,981	19,877,936	3,202,050	3,075,911	2,074,422	2,425,470	3,401,000	71,704,014
	Daily average	638,808	616,099	662,598	106,735	102,530	69,147	80,849	113,367	2,390,134
July:	Month	19,754,458	18,809,188	22,055,737	3,171,548	2,792,139	2,238,090	2,492,586	3,487,000	74,800,746
	Daily average	637,241	606,748	711,475	102,308	90,069	72,131	80,406	112,484	2,412,927
August:	Month	19,444,899	20,840,804	22,339,131	3,147,058	2,711,787	1,989,264	2,561,840	3,556,000	76,590,783
	Daily average	627,255	672,284	720,448	101,518	87,477	64,170	82,640	114,709	2,470,670
September:	Month	18,908,169	22,456,860	21,554,269	3,047,250	2,540,070	1,830,225	2,432,430	3,229,000	75,998,273
	Daily average	630,272	748,562	718,207	101,575	84,669	61,007	81,047	104,300	2,533,279
October:	Month	19,430,992	23,431,071	22,176,853	3,058,460	2,652,484	1,836,221	2,571,822	3,612,000	78,769,903
	Daily average	626,806	755,841	715,376	98,660	85,564	59,233	82,962	116,516	2,540,964
November:	Month	19,907,526	22,078,680	20,791,798	2,977,800	2,476,080	1,801,914	2,388,870	3,348,000	75,770,668
	Daily average	663,584	735,956	693,059	99,260	82,536	60,064	79,629	111,600	2,505,689
December:	Month	21,574,703	22,425,722	22,180,102	2,938,400	2,521,571	1,846,841	2,289,040	3,581,000	79,407,379
	Daily average	695,958	723,410	715,487	96,400	81,341	59,576	73,840	115,516	2,561,528
1929—										
January:	Month	23,385,939	22,417,030	23,412,192	2,861,641	2,453,526	1,807,887	2,076,070	3,279,000	81,793,285
	Daily average	754,385	723,130	755,232	92,311	79,146	58,318	66,970	109,000	2,638,493
February:	Month	22,300,707	20,448,764	20,816,209	2,529,968	2,154,194	1,569,930	1,965,656	3,122,000	74,907,428
	Daily average	796,454	730,313	743,434	91,356	76,936	56,068	70,202	111,500	2,676,265
	Total 12 months	240,602,556	250,093,899	259,844,051	37,143,275	31,382,157	22,699,113	28,501,548	41,087,000	911,353,599
	Daily average	659,185	685,189	711,902	101,762	85,979	62,189	78,068	112,567	2,496,859

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